HIRAM KE... 52ND ST. & NORMAL BOUL...

NATURE MAGAZINE

35 CENTS

FEBRUARY 1928 VOL. 11, NO. 2

Officers

ARTHUR NEWTON PACK
Princeton, N. J., *President*

CHARLES LATHROP PACK
Lakewood, N. J., *Chairman Board of Directors*

PERCIVAL S. RIDSDALE
Washington, D. C., *Secy-Treas.*

RICHARD W. WESTWOOD
Washington, D. C., *Asst. Secy.*

HARRY E. RADCLIFFE
Washington, D. C. *Bus. Mgr.*

The American Nature Association

Associates

WILLIAM L. FINLEY
Jennings Lodge, Ore.
Director, Wild Life Conservation

DR. E. LAURENCE PALMER
Cornell University, New York
Director, Nature Education

ANNA BOTSFORD COMSTOCK
Ithaca, N. Y.
Assoc. Director, Nature Education

RUSSELL T. EDWARDS
Washington, D. C.
Director, Educational Publicity

Organized to Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

The American Nature Association seeks to find for Nature Study an essential place in every School and in every American Home. It is working for Forest and Wild Life Protection along sane, economic lines. It believes that clean, healthful Out-of-Door Recreation is the key to Good Citizenship

A SPONTANEOUSLY enthusiastic response to *The Nature Almanac* has been forthcoming from many who have received it. It seems generally regarded as filling a long-felt want. The book was published as a matter of service to the progress of Nature Education, and its sale price of one dollar is considerably less than the bare cost of production. While the edition was limited it is expected that enough copies will be available to satisfy the demand from those active in the field to which it appeals. Orders will be received at the Association headquarters.

* * *

As is the annual custom, the members of the scientific Consulting Board of Nature Magazine met at dinner with the Staff recently and afterward attended a private showing of the remarkable motion pictures taken on the Association's expedition into the upper reaches of Glacier National Park, along the Continental Divide. The showing took place in the new building of the Association, where a fine display of the paintings of our two artists, R. Bruce Horsfall and Garnet Jex, was shown.

* * *

Members of the Association in the East will be pleased to know that William L. Finley will be lecturing in this part of the country during the first few months of 1928. Details about his lecture schedule can be obtained from the Extension Department, American Nature Association, 15 Boudinot Street, Princeton, New Jersey.

* * *

Many of our members have expressed delight with the cardinal cover on the December issue of Nature Magazine. Not a few have inquired whether it is possible to obtain this beautiful panel without the printing on it. To provide this it is necessary to have a new run of printing. This involves an expense which is considerable in color printing. We have, however, decided to undertake this as a matter of service and full announcement of the details of this plan will be found in the editorial section of this issue.

During the coming year the American Nature Association will continue its Outdoor Good Manners Campaign as actively as in the past. In this connection we are looking forward with interest to the results of the fine contest sponsored by Mrs. John D. Rockefeller, Jr., in cooperation with the Art Center of New York and the American Civic Association. This contest has closed, but is designed to develop interest on the part of refreshment stand owners in making their premises more attractive and serviceable to the public. The prizes in what is described as the "first contest" will be awarded for the best photographs and designs for existing stands. We imagine that there will be a subsequent contest to bring out original designs.

* * *

Municipal officials vexed with the problem of regulation of billboards may find it helpful to write to Sol. P. Elias, Mayor of Modesto, California, for a copy of his address on this subject. Mayor Elias has tackled this problem ably and successfully.

* * *

While we are on the subject of Outdoor Good Manners, here is a bit of verse sent in by the Rev. J. H. Harvey of Talledega, Alabama, and clipped from the *Boston Transcript*. Its caption is, "Fortifications Needed", and it runs:

"Give me a house by the side of the road
Where I'll be a friend to man.
He'll eat his lunch on my lawn and leave
Cracker boxes and sardine can;

He'll ruin my shrubs, my flowers steal,
On my orchard he'll make a raid.
Yes, give me a house by the side of the road
—And a barbed-wire barricade."

* * *

A group of ladies, summer and winter residents of Kennebunk, Maine, including wives of several of our leading authors can say, "Amen" to this verse. One day they left Kennebunk by auto, armed to the mudguards with rakes and boxes and baskets, and followed by trucks, to clean three sections of the highway between their community and Wells. The Augean task done in the wake of picknickers filled eight trucks. The inventory of refuse was strange to read.

NATURE MAGAZINE is published monthly by the American Nature Association
Entered as second-class matter May 31, 1927, at the post office at Washington, D. C. Additional entry at Greenwich, Conn.
Publication and Editorial Offices, 1214 16th Street, N. W., Washington, D. C.
Chicago Advertising Office, 25 North Dearborn St.
Additional Offices of Publication, Greenwich, Conn.
New York Advertising Office, 171 Madison Avenue.
Copyright, 1928, by American Nature Association
Title Registered U. S. Patent Office

What Would YOU Do?

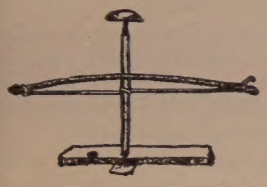
LOST IN THE WILDS -- NO FOOD -- ARISING FEVER --

For Food

No one acquainted with Ernest Thompson Seton ever starves to death in the wilds. He tells you about dozens of emergency foods—roots, berries, mushrooms, lichen growths, etc., etc.

For Medicine

The woods are a regular drugstore for those who know the medicinal value of the various leaves, barks and roots. One of the forest remedies which Ernest Thompson Seton suggests for a cold or fever is the flowering dogwood. He tells you how to identify the remedies he recommends.

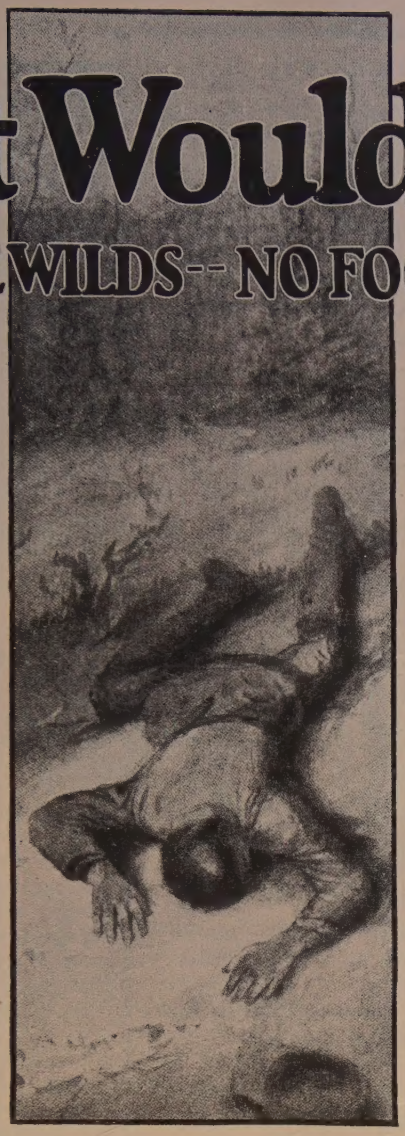


For a Fire

If your matches get wet and you are cold it is well to know the several ways of starting a fire *without* matches. Above is a drawing by Seton which shows the use of drill, block, tinder, bow and socket, all made from materials you will find in the woods.

I am lost. Help!

If you should break a leg in the wilds, if you were sick and were becoming worse every moment, you should use the S. O. S. of the forest—two fires about fifty feet apart which will send up two columns of smoke. Other means of bringing aid from considerable distance are also suggested by Mr. Seton.



The Library of Pioneering and Woodcraft will tell you what you should do and entertain you too!

IF your strength was failing—your head full of tortured thoughts of starvation—your throat parched for water—what would you do? A seasoned woodsman would not get in such a position. He would know how to avoid it. Even in strange country, he would know how to locate water, how to keep his bearings, what roots, berries and other wild foods would sustain him in time of need. But do *you* know how to avoid it? Do you know how to "carry on" if it *does* ever happen to you? Food is at your feet if you can but recognize it. Medicine is on a nearby bush but you must know which one. Help will come if you know how to signal for it.

Prepare *now* for this emergency. Prepare now to *avoid* any of the hardships of the wilds. Prepare to enjoy your outing or hunting trip *as you never have enjoyed one before!* Learn every secret of nature from Ernest Thompson Seton's *Library of Pioneering and Woodcraft.*

No other man knows animals, plants, Indians and pioneer life as he does. No one else can tell you about it all so entertainingly. You can virtually sit at this master woodsman's camp-fire and listen to him talk as you read these six wonderful volumes on life in the open. Here is every feature of outdoor life, from preparing your outfit to trailing animals and first aid.

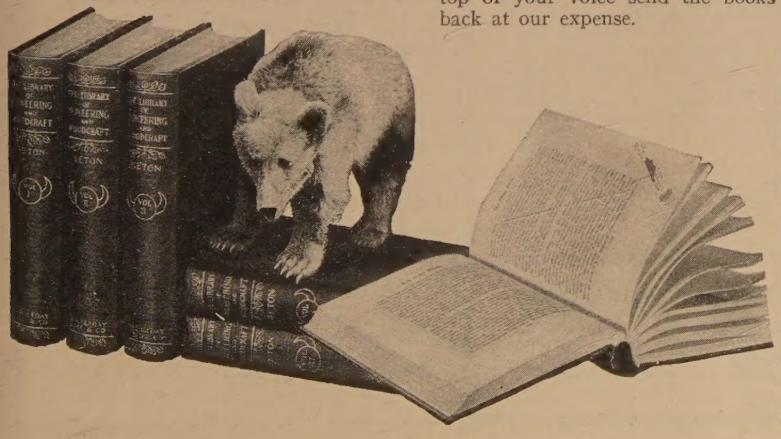
Read These Books 5 Days FREE—then Return or Pay Low Price in Easy Payments

The six books of *The Library of Pioneering and Woodcraft* are illustrated with 1450 drawings and photographs by the author. The type is large. They are handsomely bound with royal blue cloth. 1700 pages of outdoor thrills and adventure. They come to you without a cent of cost.

See for yourself why Seton is so popular with outdoor lovers. See how he thrills you. Read the articles on woodcraft. Read story after story of wild life in the open. Spend five happy evenings with Seton. Then if you are not singing his praises at the top of your voice send the books back at our expense.

Mail the coupon now! Read the books five days. Then, if you can make yourself part with them, send them back. But if you can't bear to see them leave, if Mr. Seton has become your friend, remit only $1 first payment and then $2 per month for 5 months. You don't risk a penny. Send for your set *today!*

Nelson Doubleday, Inc.
Dept. SZ-592 Garden City, N. Y.



Nelson Doubleday, Inc., Dept. SZ-592,
Garden City, N. Y.

Gentlemen: Please send me for free examination, the Library of Pioneering and Woodcraft (6 vols.) by Ernest Thompson Seton, illustrated with 1450 drawings and photographs by the author, and handsomely bound in National Blue cloth. I shall either return the books within 5 days or send you only $1.00 as first payment, then $2 a month till the full price of $11.00 has been paid.

Name.....

Address.....

City.....State.....

Occupation.....

ANNOUNCING

Getting Your Goat

or Camera Hunting on the Continental Divide

"the most thrilling and spectacular motion picture story of camera hunting ever taken in the United States"

WILLIAM L. FINLEY

who made this remarkable picture on the recent Pack-Finley expedition under the auspices of the American Nature Association, has consented to lecture with it personally during the season

January 1—April 15, 1929

All who have seen the Finley pictures in the past will agree that this is the best yet

When you have read the story of the expedition, appearing in Nature Magazine for January, February, March, July, and August, 1928, you will be more than ever eager to see this picture and hear Mr. Finley.

Rocky Mountain Goats — photographed in the wild from within fifty feet
Beaver—actually photographed in the wild while building a dam
Rocky Mountain Bighorn Sheep
Pronghorn Antelope—photographed from a pursuing automobile at 45 miles an hour
Moose, Elk, Mule Deer, Bears, Marmots

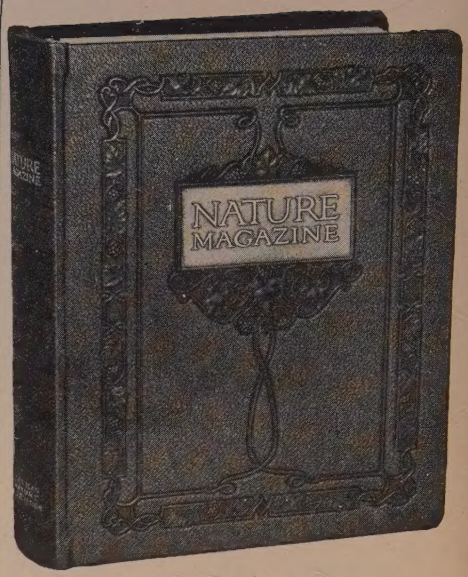
An ideal feature for the winter program of Hunting and Fishing Clubs, City Clubs, Nature Clubs; and absolutely unique as a private entertainment.

SOME of Mr. Finley's engagements include: Boston City Club; American Museum of Natural History; Field Museum of Natural History; Columbia University; Indiana University; Universities of Illinois, Minnesota, California, and Oregon; Camp Fire Clubs of New York and Chicago; City Club of Milwaukee; Westmoreland Club; Worcester Club; Carnegie Institute; Pittsburgh Academy of Science and Art; Detroit Athletic Club; Advertising-Selling League, Omaha, Nebraska; Bruner Bird Club, Lincoln, Nebraska; Philadelphia Academy of Natural Sciences; Women's Clubs of Erie, Pa., Haverhill, Mass; Toledo, Ohio, and St. Louis, Mo.; St. Paul Institute; Women's Literary Union, Portland, Me.; American Game Protective Association; Buffalo Society of Natural Sciences; various Chapters of the Izaak Walton League of America; Public Museum, Milwaukee; various Boy Scout organizations; Edison Club, Chicago; Audubon Societies of Massachusetts, Ohio, and Illinois; National Association of Audubon Societies; Hartford Bird Study Club; Saint Mary's School, Peekskill, New York; University Clubs of Detroit, Buffalo, and Cleveland; Philips Exeter Academy; Bowdoin College; Brook's Club of New Bedford; Toledo Chamber of Commerce; Miss Chapin's School, New York City; The Lawrence School, Long Island, New York.

Dates for the coming season should be arranged as soon as possible by addressing

EXTENSION DEPARTMENT
AMERICAN NATURE ASSOCIATION
15 Boudinot Street, Princeton, New Jersey

A few dates for Mr. Finley's lectures during March and April, 1928, are still available



A New Binder for Nature Magazine

Every number of NATURE MAGAZINE is worth reading again and again. For your convenience and pleasure, we have secured an entirely new binder for copies.

Grasp this opportunity for greater enjoyment from your magazines—bind them in our special two-tone, hand colored cover, embossed in gold and they will be preserved to give you a lifetime of enjoyment.

Many requests make it possible for us to offer you these artistic, leather-like covers, pictured above, especially created for our members, in which you can insert each issue, as you receive it, in a half minute, without any punching or other annoyance to try your patience.

EACH BINDER WILL HOLD TWELVE ISSUES AND IS GUARANTEED. YOUR MONEY REFUNDED IF YOU ARE NOT MORE THAN PLEASED.

$2.00 each

Regardless of number ordered. Postage prepaid to any part of the United States. For foreign or Canadian cities, add 25 cents for postage on each binder.

American Nature Association
1214 Sixteenth St., N. W.
Washington, D. C.

MAIL THIS COUPON—PRINT PLAINLY

THE AMERICAN NATURE ASSOCIATION
Washington, D. C. Date.....

Send me ..... Distinctive covers for NATURE MAGAZINE, for which I enclose $.....
If I am not unusually pleased I will return them to you within 5 days, and my money will be refunded to me.

Name .....

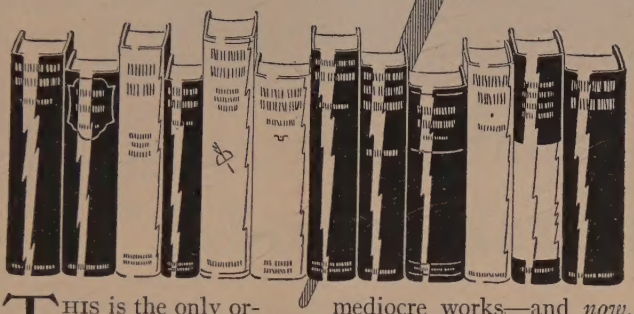
Street .....

City and State .....

Only

THE LITERARY GUILD GIVES YOU 12 BOOKS A YEAR AT HALF PRICE

Members of the Literary Guild received the following books ON THE DAY OF PUBLICATION: *The Life of Anthony Comstock, Mr. Fortune's Maggot, Tristram, Trader Horn, Tall Men, Circus Parade, The American Caravan, That Man Heine, A Short History of Women, The Vanguard, The Lost Post.* Did you read them while they were *new?* Did you get them for half price?



Instead of the trade binding, which you will see everywhere, all Guild books are bound and stamped with the name and insignia of the organization. This binding distinguishes the Guild books, sets them apart as *special editions*. Tasteful, durable, sturdy; each Guild book is made to be read and re-read many times, as books of such great interest always are.

PROOF *From Members Themselves*

Greenville, Miss.—"I fancy 'twill be many a day before you send your subscribers a book to rival your first issue, 'Anthony Comstock'." —O.A.W.

Rochester, N. Y.—"I was so enchanted with my book 'Tall Men,' that I actually forgot the worldly cares. I was really and truly thrilled with the book."—W. E. K.

Cedar Falls, Iowa—" 'Trader Horn' is surely a find. . . . If the Guild didn't publish another book this year, I would feel satisfied with what I now have. 'Trader Horn' is worth a year's subscription."—E. F. S.

U. S. N., Pensacola, Fla.—"I feel almost ashamed to accept all twelve literary gems for such a ridiculously low monetary consideration. How can you do it?"—F. E.

Baton Rouge, La.—"Congratulate you especially on the selection of Robinson's 'Tristram' for the May book. It is almost worth the entire cost of the Guild series and I might otherwise have missed it in the daily rush." —W. B. H.

THIS is the only organization of its kind in America. It gives *readers* an opportunity to subscribe to worth-while *books* before publication, exactly as the Theatre Guild gives drama lovers the opportunity to sponsor the best *plays* before production. It gives its members the prestige and distinction of being *the first* to recognize and read the outstanding books of the year—as they are issued from month to month before everyone is discussing them. It gives *you*, as a member, twelve *special editions* of important and interesting books on the same day that the booksellers receive their regular trade editions. *The Literary Guild of America* is the only organization in the United States that gives its members twelve chosen books a year AT HALF PRICE!

Its distinguished Editorial Board is composed of six of the best known men and women in American letters. These people choose the Guild book each month from the best *manuscripts* submitted to them by any of the leading publishers, authors or agents. They *know* good books. They could not waste their time on dull or mediocre works—and *now*, through their editorship—you are prevented from making poor selections yourself.

Memberships in the Guild are free. There is no charge for service or postage. You subscribe in advance for the twelve books the Guild will publish the following year and you receive these books for half the publisher's price. You will buy other books, of course, from your regular dealer, but you will not care to miss any of the Guild selections. You will not care to get them *late*.

Send *now* for full particulars of the Guild plan. Subscribe at once for next year's chosen books. Each month the postman will bring you a rare treat, the Guild package which has become famous all over the world. Put the specially bound Guild book for next month on *your* table and be assured of many hours of pleasure and entertainment throughout the year.

THE LITERARY GUILD OF AMERICA
55 Fifth Avenue
Dep't. 28 NA
New York City

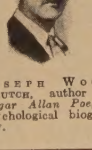
Let These Distinguished Literary Experts Solve YOUR Reading Problems.

CARL VAN DOREN, Editor-in-Chief, one of America's foremost critics.

GLENN FRANK, President of the University of Wisconsin.

ZONA GALE, author of *Miss Lulu Bett, Preface to a Life*, etc.

ELINOR WYLIE, author of many volumes of both poetry and prose.



JOSEPH WOOD KRUTCH, author of *Edgar Allan Poe*, a psychological biography.

HENDRICK WILLEM VAN LOON, author of *The Story of Mankind, Tolerance*, etc.

The Literary Guild of America,
55 Fifth Avenue, Dep't. 28 NA
New York City

Please tell me how I can get twelve specially bound, outstanding books each year for half price. I assume no obligation, of course.

Name.....

Address.....

City.....*State*.....

When March Comes—

South Africa

Roaring in like a lion —It may not go out like a lamb

THERE are always days and weeks of cold, bleak, wintry weather, when cold winds howl, when you wait longingly for soft spring breezes, warm sunshine, for the sight of spring flowers peeping out, bringing gladness to your heart.

WHY WAIT FOR IT

when SOUTH AFRICA, the land of mellow sunshine, romance, mystery and wonder beckons you?

While March winds are blowing winter out with snow, rain and freezing blasts, you can revel in the sunshine of this wonder land of warmth and beauty—of glorious flowers and luxuriant fruits. If comfort, gaiety and sport lure you—if majestic scenery thrills you and age-old mysteries awe you—come to SOUTH AFRICA.

You will find many things you have never seen and can only find in this ancient land, famous for its legendary history.

Great Diamond Mines
Mile Deep Gold Fields
Mysterious Zimbabwe Ruins
The Magic Cango Caves
Barbaric Bantu War Dances
Quaint Kaffir Kraals
The Mighty Drakensberg Mountains
Wonderful Victoria Falls
Speedy, Preening Ostriches
Kruger Big Game Park
and Glorious Cape Peninsula

Surf bathing on unrivalled sea-beaches.
Sea angling from rock bound coasts for the finest sporting fish of the world.
Trout fishing in Golden Rivers—the angler's paradise.
Golf on sporty courses midst nearby towering mountains.
Year round outdoor tennis on fast, true, antheap courts.
You travel on comfortable railroads or along fine motor roads with modern hotels to rest in.
Write for detailed information and free booklet, "In the Track of the Sun" or send 12c (to cover postage) for fully illustrated travel literature.

SOUTH AFRICAN TRAVEL BUREAU
Bowling Green Offices
11 Broadway
New York City

South Africa

Travel DEPARTMENT

The Travel Department has met with hearty favor already. Letters from readers in all parts of the country express appreciation of the service which NATURE MAGAZINE *is giving them, and the Department has received quantities of requests for detailed information about routes and cost of trips to various points in the United States and Canada, as well as cruises to the West Indies, South America and European ports. It is impossible, of course, to give space to all such answers in this column and, as greater service is by prompt reply to the letters received, those making inquiries will get answers by letter. This column will be devoted to general information of a serviceable character.*

EDITOR—*Travel Department*

* * *

A Guide to Winter Travel in America, indicating all the principal resorts and routes for travel in the United States, Hawaii, West Indies and Bermuda, together with the estimate cost, has recently been issued by the Raymond and Whitcomb Company. The Guide is a very attractive booklet, profusely illustrated. It goes into detail relative to various cruises by boat and trips by train, and is of real service to readers of Nature Magazine who contemplate winter trips. It may be had upon request from this Department.

* * *

The various lines running special excursions, as well as regular service, to West Indian ports, report unusually heavy bookings to the many attractive islands of the West Indies. This is due to a great advance in the last two or three years in the distribution of most attractive literature regarding West Indian ports, as well as a large increase in advertising by the various lines. Trips to the West Indies ranging from a few days to well over a month, may be arranged with any of several first-class steamship lines. Most of them offer ample shore trips, the cost of which is included in the cost of the entire trip, which, by the way, may be taken on good ships with good accommodations at very moderate prices. Information will be furnished to any reader of Nature Magazine.

* * *

A number of California, as well as Southwestern cities are distributing

Plan NOW *for* next summer's Vacation *in*

Northern Wisconsin and the Arrowhead Country of Minnesota

where you can enjoy a real vacation—camping, canoeing, golfing, hiking, or basking in the warm sun and breathing in that delicious pine-scented air—building up a tired mind and body.

Send for illustrated folder giving full resort information and exceptional summer home opportunities. Address

C. A. CAIRNS, *Passenger Traffic Manager*
226 W. Jackson St., Chicago

309A

CHICAGO & NORTH WESTERN RY.

She Knows Her Smokes

CRUISING THE CANADIAN

LABRADOR

by

Howard H. Cleaves

"You have heard of the *wild west*" writes Mr. Cleaves. "This is the *wildeast*. The country has changed but little since Audubon's voyage in 1833. For more than three months we never slept on land. We encountered Indians, birds, seals, icebergs, fog, gales. There were no automobiles and I almost forgot how to dodge them. We gorged ourselves on native berries, salmon, herring, codfish, trout. Once I ate porpoise. It is tender and tasty."

This new lecture, illustrated by motion pictures and expertly hand-tinted slides, has proved an outstanding feature in the courses of clubs, schools and institutes during the present season.

Other lectures by Mr. Cleaves are:

Wild Life Adventures
Outdoors in the West
Birds of the Atlantic Coast

For illustrated folder write:

AMERICAN NATURE ASSOCIATION
15 Boudinot Street **Princeton, N. J.**

special circular matter advertising their many attractions. These are available from Chambers of Commerce and are in much demand by Eastern and Midwestern people who contemplate trips to the warm climate of Southern California and the Southwestern part of the United States during the winter. Information may be had about any of these cities and resorts by writing directly to the Chambers of Commerce and quoting Nature Magazine, or by writing to the Travel Department.

* * *

All of the railroads running to the West and Northwest, and Southwest have attractive literature ready for distribution to any prospective traveler to the sections they may serve.

* * *

Florida, Alabama and Georgia hotels, as well as those of other Gulf Resort States, report the opening of the winter season is taking to the South a number of early arrivals, and in such quantity that they expect a first-class season. They state that the moderate weather in the North made them fear a light season, but, following the cold spell prior to and around the Christmas holidays, the bookings on the railways running to the South largely increased. The railroad men state they expect steady business during January and February.

* * *

Resort and commercial hotels in Southern Arizona and other sections of the Southwest are being exploited by circular matter distributed by the Santa Fe Railway as giving opportunity to the traveler to see "the strange and different country in which there may be seen deserts of mystery and color, valleys of perfect peace, mountain ranges, big trees, olives, orange groves, cacti, yucca and the columnar sahuaro."

* * *

Americans who for many years have made an annual pilgrimage to Bermuda following the Christmas holidays, have booked in considerable numbers on the various lines running to Bermuda. Going also are a number of visitors to whom Bermuda is entirely new, but many of whom, as usual, may become regular winter visitors to that attractive island. While many of them stay at the hotels in Hamilton, they also find a most excellent hotel at the north corner of the island at St. Georges, most beautifully situated on a bluff over a fascinating harbor and on one of the highest points on the island.

Camera-Hunt the Rocky Mountain Goat in **Glacier National Park**

Being a United States game sanctuary, where shooting is prohibited, this million-acre mountain playground affords an unusual opportunity to stalk with a camera many interesting animals.

Great numbers of picturesque Rocky Mountain goats may be glimpsed all along the main ranges through the Park. Here you will also find bighorn sheep, blacktail and whitetail deer, black and grizzly bears. Approximately 1,000 head of elk range through the densely timbered sections of the Park. There's sport aplenty, too, for those who like to tussle with cut-throat trout and other gamy fish.

Plan now to come to Glacier National Park—picturesque mountain home of the Blackfeet Indians—this summer. You can travel there on the New Oriental Limited—finest train to the Pacific Northwest—at no extra fare. Write for illustrated books.

Your Adventureland vacation should include a visit to the new Prince of Wales Hotel in Waterton Lakes National Park, an extension of Glacier National Park across the international boundary into the Canadian Rockies.

GREAT NORTHERN

ROUTE OF THE NEW ORIENTAL LIMITED

GREAT NORTHERN

A dependable railway

Mail the Coupon — N-2

A. J. DICKINSON, Room 712
Great Northern Railway, St. Paul, Minn.

Send me free books describing recreation in Glacier National Park, also cost from this point of a_____day stay in the Park for a party of_____. I am particularly interested in:

☐ General Tour of Park ☐ Pacific Northwest Coast Tour

Name_____

Address_____

Young Water Ouzel Just Out of Nest

THE AMERICAN NATURE ASSOCIATION
Presents

GUY C. CALDWELL

Rocky Mountain Guide

in Nature Programs De Luxe

Illustrated with hand painted slides, motion pictures and autochrome plates (direct color-photography)

Subjects now available

1. The Rocky Mountain National Park.
2. Bird Songs and Wild Flowers.
3. Trees—Beauty, care, conservation.
4. Autochrome Studies of the West.

A recital of bird and animal calls precedes the lectures—135 programs given last season. "The most beautiful program we have ever had" is the usual comment.

During the summer Mr. Caldwell conducts nature camps for boys and for women in the Rocky Mountain National Park, Colo. Ask for folders.

AMERICAN NATURE ASSOCIATION
15 Boudinot St. Princeton, N. J.

Audubon Bird Cards

Postal Card Size in Full Color

50 for $1.00
FIRST SERIES

The Winter Birds of Eastern North America

Other series later

Reverse side of each card carries an account of the habits, activities and distribution of each bird. Prepared under supervision of Dr. Frank M. Chapman.

Order Now

AUDUBON BIRD CARDS
1214 Sixteenth Street
Washington, D. C.

36 Wild Flower Color Plates

25 cents per doz. $5 for 25 doz.

Outline Drawings

12 cents per doz., 75 cents per 100.

Wild Flower Seed

10c per pkt. 12 pkts. $1.00

Annual members with quarterly periodical, Wild Flower, $1.50. Junior clubs of 25 or more at 10c each receive button and outlines to color with free color plate and literature for organizer.

Wild Flower Preservation Society
3740 Oliver St. Washington, D. C.

TWO ANNOUNCEMENTS OF INTEREST

WHO WANTS A CARDINAL?

While we of course appreciated the beauty of our December Cardinal cover, we admit that we did not anticipate the general enthusiastic response to it from our members. Many letters were received asking whether this beautiful panel could be obtained minus the cover lettering. We have now found it possible to do this through a special printing.

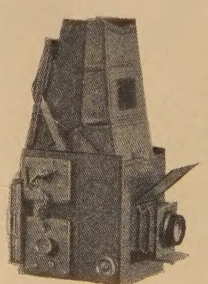
Color printing is expensive, especially in small runs, but as a matter of service to those of our members who have written about this and to those others who undoubtedly would be interested, we will make this picture available at cost of printing and mailing. This cannot be less than twenty-five cents a picture, since each one must be mailed flat with cardboard protection.

Each picture, with all lettering removed, will be the same size as the panel on the December cover. It will be admirably adapted for framing or other decorative use, such as making into a calendar for 1928. *One or more of these fine pictures will be mailed for twenty-five cents each to those placing orders and as long as the supply lasts. Three thousand copies will be printed. Send your order to American Nature Association,* 1214 *Sixteenth Street, N. W., Washington, D. C.*

THE PHOTOGRAPH CONTEST

In the January issue we announced a monthly photographic contest with prizes and now call it to the attention of those who may have missed the announcement. New members may obtain details by writing the Photographic Editor.

Prizes are offered for the best five photographs in each monthly contest and in the special contests. The first prize is ten dollars and we are pleased to announce that the Folmer Graflex Corporation has kindly offered to double the first prize if the winning picture was taken with a Graflex camera. Let the owners of Graflex cameras, then, get busy and get their pictures into this contest. Be sure and indicate the fact that your camera is a Graflex so that it may qualify for the special prize award that is now made available.



In connection with the photographic contest we want particularly to urge entrants to consider the Garden Photograph and Outdoor Good Manners Photograph contests. These are special contests to run for several months and will give an opportunity to get pictures specially for them. Do not overlook these interesting special contests.

Send a two-cent stamp for full details of the Photographic contests if you do not have a January magazine handy.

NEGATIVES WITH PRINTING QUALITY.

In all branches of photography, whether Nature work, landscape, portraiture, commercial or any other, the printing quality of a negative is of utmost importance if we would obtain the best results. The primary consideration of every photographer, whether amateur or professional, should be a negative of a quality that would make the very finest possible print on some one of the standard brands of paper.

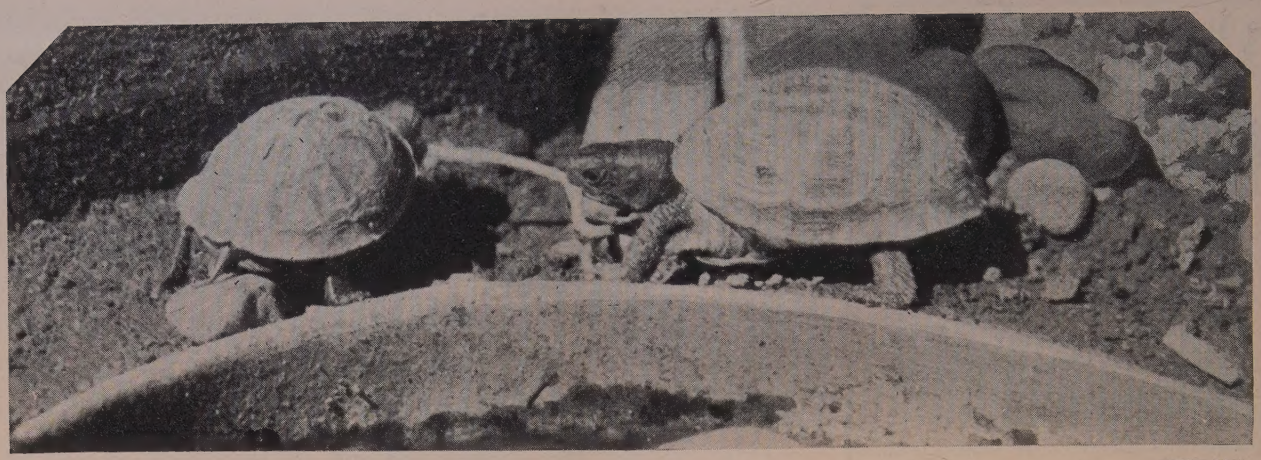
Of course, with the same brand of paper made in several degrees of contrast, such as are on the market at the present time, it is possible to suit a paper to the negative even though the latter may not be of good quality. In making these various grades of paper, however, the manufacturer has simply made it possible to obtain good results from poor quality negatives that have been either over or undertimed in the exposure or development. These are usually the result of laziness on the part of the photographer in not learning the first requisite of his art, the making of a perfect negative.

If one cannot trust his eyes to correctly judge the length of exposure necessary with the lens he is using under all the varying conditions of light then I should advise the use of an exposure meter of which there are several very good types on the market. The best advice I can offer, however, is learn to know your lens and this you can accomplish by study and the exercise of a little patience so perfectly that you will rarely go seriously wrong on an exposure.

To help in accomplishing this it is a good plan to make several exposures on the same subject, under the same lighting conditions, at different speeds. Develop them all for the same length of time in the same developer until they have sufficient density. Make prints from them all on the same grade of paper and if you have kept records of your time of exposure and development the prints will show you which exposure is most nearly correct. This will form only the basis, though an excellent one, for a thorough knowledge of your lens. I will add that, in stopping down the lens in order to sharpen definition, the length of time of exposure should be about doubled with each smaller stop used.

(Continued on page 132)

GRAFLEX
gets the whole story
Newspaper reporters tensely watching . . . leased wires and cables humming. Radio announcers at microphones. But . . . in a flash, Graflex has caught the detailed story.
At last—a Graflex priced within reach of everybody. "Series B"—3¼" x 4¼" — speed up to 1/1000 second — $80. Other models $85 to $375.
Featured by A Good Dealer Everywhere
GRAFLEX
PERFECTLY SIMPLE
SIMPLY PERFECT
FOLMER-GRAFLEX CORP.
ROCHESTER, NEW YORK



ERNST KEIL

THE WORM GETS THE WORST OF THE ARGUMENT
It is finding it difficult to turn with two turtles contesting for the right to a meal

NATURE MAGAZINE

PUBLISHED BY

THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

PERCIVAL S. RIDSDALE, *Managing Editor*
ARTHUR NEWTON PACK, *Associate Editor*
RICHARD W. WESTWOOD, *Chief Editorial Staff*
R. BRUCE HORSFALL, *Artist*
EDWARD A. PREBLE, *Consulting Naturalist*
HARRY E. RADCLIFFE, *Business Manager*
GARNET W. JEX, *Assistant Artist*

Scientific Consulting Board

DR. L. O. HOWARD, Senior Entomologist, U. S. Bur. of Entomology
DR. HARRY C. OBERHOLSER, Biologist, U. S. Biological Survey
HENRY O'MALLEY, U. S. Commissioner of Fisheries
C. W. GILMORE, Curator of Vertebrate Paleontology, U. S. National Museum
DR. WALDO L. SCHMITT, Curator of Marine Invertebrates, U. S. National Museum
VERNON BAILEY, Chief Field Naturalist, U. S. Biological Survey
DR. PAUL BARTSCH, Curator of Mollusks, U. S. National Museum
DR. EDGAR T. WHERRY, Wild Flower Preservation Society
T. GILBERT PEARSON, Nat. Assoc. of Audubon Societies
DR. WILLIAM M. MANN, Director, Nat. Zoological Park

$3.00 a Year

35c a copy

TABLE OF CONTENTS

February, 1928

SIX BIRDS OF THE SOUTHWEST ..... *Carra E. Horsfall* 78
NATURE CALENDAR ..... *E. Laurence Palmer* 79
STRONGER THAN DEATH ..... *Dallas Lore Sharp* 81
BIRDS THAT HAVE NAMED THEMSELVES *W. L. McAtee* 85
A TREE MURDERER ..... *E. H. Mears* 87
CAMERA HUNTING ON THE CONTINENTAL DIVIDE *Arthur Newton Pack* 88
THE SPHINX CATERPILLAR 94
RELATING HOME AND GARDEN ..... *Estelle H. Ries* 95
OYSTERS OF THE BLOOD ROYAL ..... *Ernest S. Clowes* 99
A TRAVELLING HOME SITE ..... *Nevin O. Winter* 101
EVENING SHADOWS ON THE SANTA RITA *Walter P. Taylor* 102
SUMMER CAMP MUSEUMS ..... *William G. Vinal* 104
THE TALL TWIGA ..... *Stephen Haweis* 106
SWAMPS, BOGS, MARSHES ..... *Charles Fitzhugh Talman* 109
CAPTURING THE OUTDOORS ..... *Walter D. Kerst* 113
OUT-PACKING THE PACK RAT ..... *F. W. Schmoe* 117
SIRIUS AND ITS STRANGE COMPANION ..... *Isabel M. Lewis* 118
HINTS AND HELPS FOR HOME AND GARDEN *Thomas Sheward* 120
NATURE EDUCATION ..... *E. Laurence Palmer* 122

Nature Magazine, past and present, is indexed in the Reader's Guide in your library.

NATURE MAGAZINE is published monthly by the American Nature Association
Entered as second-class matter May 31, 1927, at the post office at Washington, D. C. Additional entry at Greenwich, Conn.

Subscribing Membership Blank will be found in the back pages of the magazine.

Publication and Editorial Office, 1214 16th Street, N. W., Washington, D. C. Additional Offices of Publication, Greenwich, Conn.

ADVERTISING OFFICES

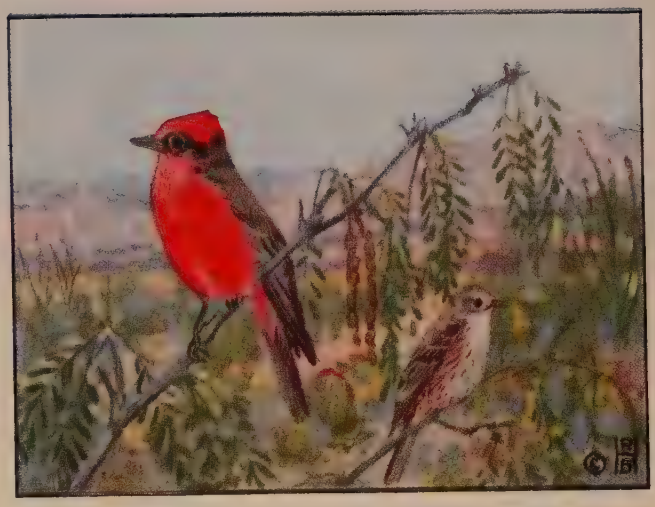
New York—171 Madison Ave.
Chicago—Mather Tower Bldg.
San Francisco—Hunter-Dulin Bldg.
Los Angeles—Lincoln Bldg.
Seattle—Henry Bldg.
Atlanta—Grant Bldg.

Copyright, 1928, by American Nature Association
Title Registered U. S. Patent Office

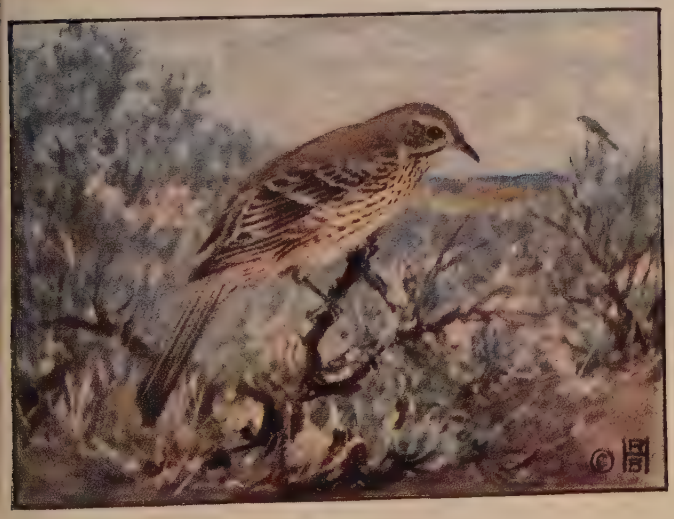
Bullock Oriole—*Icterus bullocki*

Phainopepla—*Phainopepla nitens*

Californian Woodpecker—*Melanerpes formicivorus bairdi*



Vermilion Flycatcher—*Pyrocephalus rubineus mexicanus*



Sage Thrasher—*Oroscoptes montanus*

Water Ouzel—*Cinclus mexicanus*

Six Birds of the SOUTHWEST

by Carra E. Horsfall

(Color Plates by R. Bruce Horsfall)

THE garden of a famous old mission in the desert country of southern Arizona is a favorite haunt of the vermilion flycatcher, one of the brightest bits of color I have ever seen. From some suitable outlook he darts out in pursuit of winged insects. Tree-covered stream beds and groves of mesquite are frequented by this bird even to the altitude of five thousand feet. His frail nest, built of twigs, fine grasses and plant-down, is placed on the horizontal branch of palo verde, cottonwood or oak six to fifty feet from the ground. The buff, blotched eggs number two or three. It is a matter of regret that the range of this bird is comparatively limited. His strong persistent call note quite overbalances his charming conversational twitter.

Wherever oaks are found along the Pacific coast from Oregon southward, and east into Texas, the Californian woodpecker will be present. He is much like the red-headed woodpecker of the East in appearance and manners. A notable characteristic is his habit of storing acorns in holes made in the bark or decayed limbs of trees. These nuts are so securely wedged in that it is impossible to extract them without a tool of some sort. Both the birds share in the excavation of the nest hole, usually well out on the under side of a limb of sycamore, cottonwood or live oak. Telephone poles are also commonly used. The five or six eggs are of characteristic woodpecker white. The birds return to the same neighborhood year after year, but do not use the same hole for nesting. A new one is made near by and the male uses last year's home as a refuge or sleeping quarters. These woodpeckers are sociable and friendly, nesting and hunting in companies.

FINLEY

HUNGRY PHAINOPEPLAS

These are among the most interesting of birds of the Southwest

In the sage-covered Great Basin region and arid western plains, as well as the foothill country of the Southwest, dwells the sage thrasher, a singer who nearly takes the palm from the eastern brown thrasher. He belongs to the same family and chooses the same character of living quarters. Greasewood, sagebrush or sometimes a cactus near the ground serves as a location for the bulky nest of coarse thorny twigs and sage brush, lined with horse-hair and soft fibers. This structure may be partly roofed over and will contain from three to five rich green-blue eggs which are spotted with reddish brown. This bird, like its relative the mockingbird, delights to sing at night.

The Bullock oriole is the near-counterpart of the eastern Baltimore oriole. He takes similar care in the construction of the nest which is a pensile basket of vegetable fibers with twine and bits of bright colored wool lined with down, and holds three to six eggs. The same tree is used again and again as a breeding site and six or eight nests are often seen on the same cottonwood tree, showing all stages from the new home to the well-frazzled old ones of previous seasons. This oriole chooses open country near the tree-grown margins of streams. It may be found in suitable locations throughout western North America, north to British Columbia and east including the Rocky Mountain States. The song is not so varied as that of the eastern relative, for the bird is satisfied with only few changes. Bullock oriole feeds on caterpillars and other insects, including the injurious scales which create havoc in olive and other orchards. It is fond of fruit but when found in a berry patch is probably taking more green larvae than berries.

Phainopepla, formerly placed in the same family as the waxwings, is a silky flycatcher which is found only in the southwestern United States. When perched quietly on a pepper tree enjoying the berries, he might be mistaken for some slender exotic blackbird which had developed a crest. But the moment he flies away, the large white wing patches reveal his identity. The saucer-like nest, made of small twigs, plant fiber and down, is placed in a horizontal crotch of a pepper, mesquite or oak, and is built by the male bird. During its construction the female is said to be off feeding and gossiping with others in the nearby shrubbery. Two to four young are raised each season.

The water ouzel is the only member of the dipper family to be found in the United States. Most mountain streams are frequented by this bird which is at home from sea level to an elevation of nearly ten thousand feet. From central Alaska to the Mexican boundary and east to the base of the Rocky Mountains he is a permanent resident in his chosen location. Weather means nothing to him for he is as jolly in winter as in summer and sings either season as the spirit moves him. Since he is able to hunt his food under the water upon the rocks in the stream-bed where dwell the larvae of caddis flies, damsels and dragons, beetles and bugs, he can find a living at any time. The nest of moss, with a side door, is placed where spray will keep the outer walls green and fresh. Three to five white eggs change to hungry babes which keep the parents busy. In due time these young join their elders along the banks of the home stream.

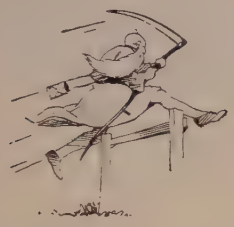
NATURE CALENDAR

FEBRUARY

by E. Laurence Palmer

BECAUSE this is Leap Year, this February will be a day longer than the February we have come to know for the last few years. It seems strange to think of how in the past before this extra day was added, the official calendar fell some three months behind Nature's calendar. It seems equally strange that we are such creatures of habit that we cannot recognize the advantages which would arise from the establishment of months of equal length. An autocracy possesses merits as well as disadvantages not found in a democracy.

During February the snows may be darkened by the shadows of trees, groundhogs, weed tops and snowmen. These shadows may be measured easily from day to day if they are produced by trees and weed-tops even though this is not so easy with the other examples. Drive a stake into a snowbank where the shadow of some tree falls at noon and watch this shadow shorten during the month. It may be encouraging to realize that summer is coming in spite of winter's bluster.



The groundhog's shadow will be much less significant than the shadow cast by trees and weed-tops. Walter Pritchard Eaton speaks of some weed-tops as being the "ghosts of our fairest flowers". Important among these will be, no doubt, the evening primroses, the sunflowers, the goldenrods and asters, milkweeds, and even butter and eggs whose beauty would probably be more appreciated if it were less common. You may get pleasure from seeing how attractive photographs may be made of common weeds photographed against the snow. They appear much more pleasing in this natural setting than when stuck to cards.

The snowmen of February may have been evolved from snow packed about skeletons of sticks, wire, tools or plain ordinary junk. Not infrequently we may find snowmen with no skeleton whatever and the result is not pleasing. While pondering the matter of skeletons you might like to read Ruskin on "The Seven Lamps of Architecture". Ruskin was born in February. In his essay he points out what a difference it might make in the animals of today if their skeletons might have been made of flint or diamond instead of being of "marble architecture". What a difference it would have made in our general appearance and in our ability to conceal our feelings had it been our lot to wear our skeletons on the outside as do grasshoppers. Certainly such an arrangement would be unique. We would be permanently smiles or smileless. We could deceive our bridge opponents perfectly.

Skeletons may tell stories however, and February is a good month to be able to read these stories. We read the skeleton of a grape-vine in February and prune it so that the vine may grow with profit to us next summer. We find the skeleton of some wild animal or bird in the woods and study it in the hope that we may be able to know the cause of the creature's death. We may not be able with our inexperience to tell exactly what species of animal was represented by the skeleton, but we can recognize characters held in common by rodents, others held in common by relatives of cats and others by the dog relatives.

Charles Darwin was born in February. For years he studied the resemblances and differences possessed by a great number of forms of life. He travelled extensively, observed carefully, made extensive notes and eventually formulated his theory of evolution. His book "The Origin of Species" set others to work observing, experimenting and recording their findings. While these subsequent studies have modified the accepted belief, so far as the method of evolution is concerned, they have also strengthened the general conviction concerning the fact of evolution. The one constant thing in Nature is change. Savages observing an airplane might argue as to whether the machine moved because of the sound it made or because the wind blew it but both would be convinced that it moved.

It is recommended that those who are skeptical of the close relationship existing between species of living things spend the month of February trying to distinguish the different kinds of oaks by means of their winter twigs. When this is done it might be well to try the members of the genus to which the cherries, plums and peaches belong, and, if this is not sufficient, then the willows are to be found and studied during the remaining spare time. For those not desiring such difficult tasks the maples, elms, poplars and the like will be interesting and not discouraging. I am sure that I have already outlined enough activities to more than last through February even though it does have an extra day this year. By March first, the snowman will have gone. The sun and the rain in a short time produce profound changes. During long periods of time the great variety of factors present in Nature have produced and will continue to produce profound changes in the life of the earth.

ROCKY MOUNTAIN GOAT IN GLACIER NATIONAL PARK

(See Article Page 88)

NATURE MAGAZINE

Volume Eleven
No. Two

February, 1928

"A SHE WOLF WITH A PAST"

STRONGER THAN DEATH

The Strange Story of a Lone Wolf with a Limp

by Dallas Lore Sharp

So now again she killed, killed, killed, to satisfy a restless, savage something within her—a something which nothing satisfied. Meantime she traveled, far beyond her regular haunts, but always around to her empty, unshared den. The cattle men in distant valleys, whom she had never molested except in the dead of winter and with her pack, felt the deadly work of her fang. She was seen wandering back among the highest canyons, up above timberline and over the divide, a lone she wolf with a limp, who was known by every trapper, prospector and rancher in that section of the Medicine Bow Mountains.

Report of her came to me first at Laramie, Wyoming, —a she wolf with a past and anything but a savoury present, a timber wolf with a bullet-broken forepaw, and a brain for leadership and strategy that had twice put her at the head of packs, and had twice saved her from the destruction that had overtaken her raiding bands.

She was now without a band. Not a wolf, except the lame leader, had escaped the drive of the ranchers. Wolves were nothing like so plentiful in that high country ten years ago as they are today. The herds of wild horses which roam the flats since the war, and the marked increase of game, especially of deer, in the wake of the stricter hunting laws, has made life more abundant for the wolf, and he, too, is on the increase. It was not easy, at the time of this story, for the lame leader to round up another pack.

But it was not leadership, it was companionship, a deeper, more compelling need, that she was seeking. This was the secret of her restless wandering and her killing. A price had long been upon her head. It was doubled now. Every man's hand was against her. Even the Government sent its man, trained to the ways of wolves, to take her. But she was a match for all of their hands, a careless cunning, a kind of tempered defiance, the talk and admiration of the ranchers, stamping all of her plans and actions.

The bold unexpectedness of her movements had become even more marked of late. She was frequently sighted by the riders, and, higher up the flanks of the grazing grounds, by the sheep herders, trotting along some trail, or from some rocky point, well out of rifle range, watching with strange interest the doings in the cattle-dotted valleys below. Let the dusk come, and let the moon pour over the plains, then she would give speech to the deep silence, such speech as would turn any rider in his stirrups to listen, hearing something in his heart

as old as life and as deep and dark as death itself.

From tooth to claw a wolf, she was more than a wolf, as we at times are more than men. Currents and passions stronger than habit and deeper-seated than kind, were working within her, leaving her unwolfish and weak, and at cross purposes with her very nature. Contemptuous of poison bait and deodored, hidden trap, and the dread, mysterious rifle; at war with those who gave no quarter, she asked no quarter, and had known no law but her own, before this weakness came upon her.

"THEN SHE WOULD GIVE SPEECH TO THE DEEP SILENCE"

The mountains were lonely; her den was lonely; her heart was lonely; so lonely that she envied the ranch dogs, and could have whined and fawned and cavorted about the herders as the dogs did for the sake of the companionship which they enjoyed. So, lying with her head outstretched upon her paws, she had taken to watching the sheep dogs at work, or skulking about the ranch yards at night she would wait for a collie or a hound to come out and chase her back into the hills. Every yapping, white-livered little coyote in the sage-brush had his mate to bay with him in the long, lonesome twilight, but for her there was no mate in all the wolfless mountains.

All day long she had been watching from the ledge at the mouth of her den. The slow dusk was creeping up the canyons when she rose yawning from her lookout, and shaking herself, stood gazing off across the level sage in the direction of Double UU Ranch, a blur of green against the sterile buttes twenty miles down the valley. She saw nothing, caught nothing on the wind, yet irresistibly, though laggardly, and with many a halt and misgiving, she set off in the direction of the ranch.

As the last ranch at the foot of the valley Double UU had suffered more than the others from the raids of the lame wolf, and she well knew that this was a place now for her to keep far away from. Against her own good sense, and against her very will, she kept on. A hundred times she had traveled this dangerous trail, until she knew every turn in it, every broken rock to leap, every wash, and flinty open space to cross.

Leaving the foot of the hills she crept under cover of the sage to a cattle path and trotted softly down to the branding corral at the spring, then on toward the tall, close-set wall of cottonwoods and poplars that outlined in the dusk the barns and yards. A wedge of a badger in the mouth of his burrow frightened her. Ba! a badger! She would break the varmint's back with a snap! Here she had lately killed a new-dropped calf, and they had poisoned the carcass against her. Ba! as if they could poison her! She caught sight of a good-sized shoat. But she was not hungry. She was not killing pigs tonight. She hardly knew what she was doing, or what had brought her here.

But the ranchers knew when they saw her tracks next morning and the tracks of Rob Roy, the best sheep dog in the valley, tagging with those of the wolf until they were lost in the sage. For in the morning the collie was gone. Night came and he did not return. The next day the head rider of the ranch and the Government trapper took up the trail of the wolf and the dog, following it toward the mountains.

"HER TRACKS THE NEXT MORNING"

Four days later two moving figures were seen by the hunters over against the burnt slopes of Bonnet Butte, a pair of wolves as they descried them, the moving dots being twice too large for coyotes. And then the fawn-colored coat of Rob Roy could plainly be seen in contrast to the grayer one of the wolf.

The wolf also had eyes. She saw the riders, saw them whirl and come galloping her way with all the speed they could make, and she quickened her pace, separating herself from the collie, then coming back to him, broke with him into a canter, vanishing up a narrow ravine between the buttes.

Throwing the bridles over their horses' heads the two riders plunged into the ravine, the cattle-man shivering the hush of the winding walls with a familiar whistle. The dog heard it and halted. The wolf was prepared for just this thing, and playfully wheeled about him, brushing him with her flank, and, luring him on, led him through another fold in the walls. One more such turn and she knew a slit in the face of the rocky height through which nothing larger than a wolf could squeeze. Once within this deep crevice and the wide arms of the mountains would enfold her and her stolen mate forever.

But the ravine twisted and folded back upon itself. Over a bare shoulder of it, cutting off several winding turns, the men climbed to head off the animals, and Rob Roy halted in his tracks as a human head and body rose suddenly above and in front of him, and before he had recovered from his slow surprise a swirling, snakey lariat had jerked him into a snarling heap.

There was no sign of the she wolf. She had

"A COLLIE PUP IF THERE EVER WAS ONE"

scented or heard the men behind the ridge and had melted away, spoiling the prime object of their hunt. Her ears would have been worth several Rob Roys.

Behind the riders, very much of a hang-dog, at the end of the lariat, the wayward collie came back to the ranch. They might as well have let him go with the wild wolf. Humbled, stung, guilty it may be in his own conscience of unfaithfulness, he leaped at the face of his former master who tried to free him, and in his acute misery, fell upon the hard leather lariat, and slashed it with his teeth. He had never been struck by a human hand before. That night he should spend in "the cooler."

As the long shadow of Bonnet Butte ran cool across the plain, Rob Roy suddenly sat up and listened. Then he rose, the hair along his back rising with him. It was not the coyote. He knew their chatter. This was wolf-talk, and the hair rose about his shoulders. But only for a moment. The far off voice was nearer now, and it was for him, for him alone. So he lay close to the wire wall and waited.

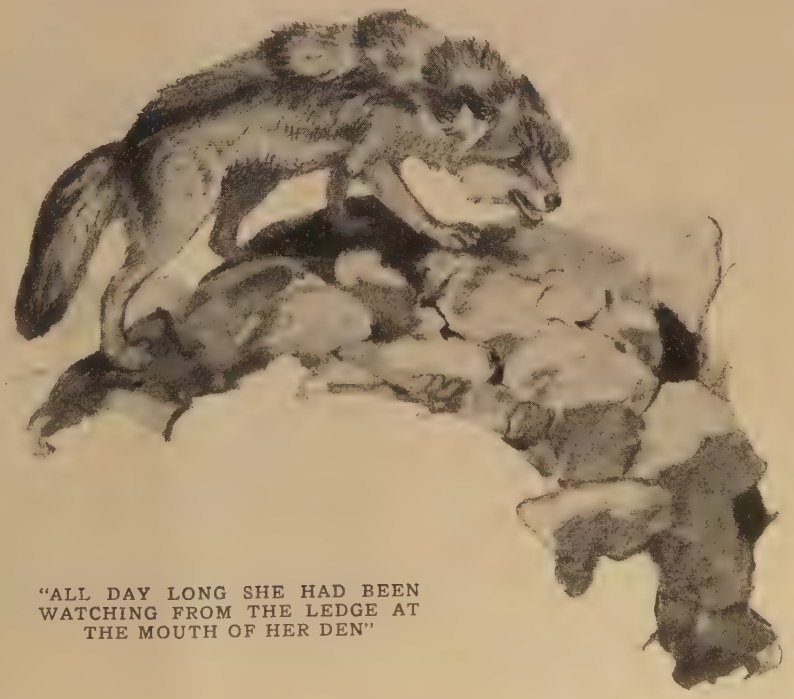
The long shadows of the buttes merged with those of the higher mountains and crept cool across the plains. They blotted out the buildings of Double UU Ranch, flooded the tall Lombardy poplars and cottonwoods and sunk a cage and a collie as at the bottom of some primordial sea. The wailing snarl of the coyotes had ceased when, silent and swift, a shadow out of the shadows glided up to the wire walls, and with lean, sinewy strength and with fierce purpose began to dig.

Rob Roy was never seen again. The werewolf took him, for werewolf she seemed in her half-human cunning. For better or for worse she took him, and no one in that section of the Medicine Bow country ever knew, except by inference, for which it was. Where and how his end came would make a stirring story.

Nothing was seen of the lone gray wolf, either, for a time. The killing among the flocks and herds almost ceased. But soon it began again, and again, the gaunt figure of the lame wolf appeared along the base of the wooded buttes. It was not uncommon for her now to pull down a yearling steer. Either no other wolves had wandered into the mountains that winter, or on account of her collie mate she had driven off any that had invaded her hunting ground, for always now she was seen alone.

One thing was certain, and the whole valley organized to bring it to pass—the lame wolf must be taken. But old Club-foot was organized to outwit them. She had no rule for killing. Never did she seem to do anything twice alike. And what experience and native wit had not taught her of man-craft was not worth her knowing. She was thoroughly schooled in self denial, too. But a she wolf can be as weak as water.

Spring hurried on toward summer and there was no let-up in the killing. At the mouth of Coyote Canyon where the little creek makes into the plain, was "The City," three or four tumbled miners' huts of stone, built years ago at the time of a "gold rush." One of the houses still showed something like four walls, caved in on three sides against a stub of a chimney. By the chimney end rushed Coyote Creek, with the trail up the canyon going past the opposite end of the ruin. Part of the chimney and the end wall of the cabin lay in a heap in the bed of the shallow stream.



"ALL DAY LONG SHE HAD BEEN WATCHING FROM THE LEDGE AT THE MOUTH OF HER DEN"

Coming down the trail one day in late spring a rider saw a little creature, the size of a small puppy, run up the fallen chimney pile from the stream and disappear within the ruined shack. He followed, and peering over looked down upon four puppies, the little brown thing which he had first seen, which was a collie pup, if ever there was one, and three that were young wolves.

How very simple! How plain and daring! Up the canyon or down, the old wolf could travel the bed of the shallow stream, step out upon the fallen chimney pile, thence down the wide flue to her den under the debris of the crumbled walls. No wonder the dogs could never follow her! And here on the edge of the valley in view of the herders, when it was thought that she had denned far back in some wild cave of the hills!

For fear the old wolf would discover that she had been found out and so come and carry off the imps before he could ride to the ranch for help, the cow-man decided to drop into the ruin, block the entrance to the den and kill the pups, when a deep and, it must be confessed, a fiendish scheme for taking the whole family, mother and all, came to him.

Watching his chance, he leaped quickly into the small open space, landing fairly in the mouth of the den, scattering the young and capturing two of them who made for the hole. Killing the other two he swung into the saddle with all of them, riding for Double UU.

The wire cage in which Rob Roy had been put still stood beneath the poplars, a slight hollow under one side, though now nearly filled, showing where the father of this mixed litter had made his escape, clear back to his ancestral past, as if there had been wolf in the collie. In this wolf-dug hollow now, and artfully covered, were hidden two heavy traps. Stakes were driven in about the other walls, and then the four pups, two alive and unhurt, were left alone in the cage.

That was not the end of the story. But it was nearly the end, and what followed is not the sort of a thing one likes to relate. Nor is it pleasant reading, nor easy, all in all, to understand. No one acquainted with mother-love as it shows itself in wild Nature needs to be told what happened. He can see the hair rise along the back of the great gray wolf as she caught the hateful scent upon her bridge of stones. He can see her in the middle of the creek coming out a grizzly, terrible figure of love and fear and death to look down into her empty den—full of the tracks and the woe of man!

And then the realization, like a stunning blow, the leap from the ruin, the instinctive taking of the rider's trail, then the blind, lolling canter, mile after mile across the sage-covered plain. It was a wolf who suckled Romulus and Remus. She would have crawled whimpering to the feet, and licked the sweaty hand that had torn the pups from her dugs could that have restored them. Or she would have met him with her bared teeth, and all the valley with him, would that have given her back her own. There is nothing weaker and stronger on earth than a mother, wolf, or whatever form she assume.

They saw her crouching in the rabbit-brush beyond the hedge of trees, not ready to die, but unable to live for the crying in the cage. They saw her hurl herself against the wire and rebound, and hurl herself again, when the rifle spoke, and the body of a great, gaunt timber wolf lay still beside the wire cage. That's all. But somewhere, one must almost hope, somewhere in a happier hunting ground, a mother with one fluffy brown, and three gray pups, stretched herself out comfortably at the sunny mouth of a den and gave them suck.

"Birds and beasts were in my blood", writes Dallas Lore Sharp, author of this and other fascinating articles in Nature Magazine. "Doctors with their own 'yarb gardens' and tamed wild things run far back in my line. Farmers and seafarers on the other side, all of them collectors of the strange and visitors to out-of-way places."

Dr. Sharp needs little introduction to many of our readers, who know his writings, here and elsewhere. His home is in Hingham, Massachusetts, where he has a wild life sanctuary of his own, but his real home is in the woods, where, he testifies, he was born and has grown up. "Woods, woods, woods —they always allured and entranced me."

His first great book was Gilbert White's "Natural History of Selborne", which he bought after much secret saving in his early teens. In less than twenty years his first published book carried the title, "Wild Life Near Home", reminiscent of his first literary love. His latest book will be off the press in March entitled, "The Better Country."

CHICKADEE CHIRPS HIS OWN INTRODUCTION

Waldo Lee McAtee was born and reared in the Mississinewa Valley of Indiana, in a region already notable as the birthplace of Joaquin Miller. He came to Washington in 1904. Although perhaps best known as an ornithologist, he has done outstanding work also in botany, entomology, ichthyology and herpetology.

THE JAY TELLS ALL THE WORLD ITS NAME

BIRDS THAT HAVE NAMED THEMSELVES

And Have Put Many Words in the Dictionary

By W. L. McAtee

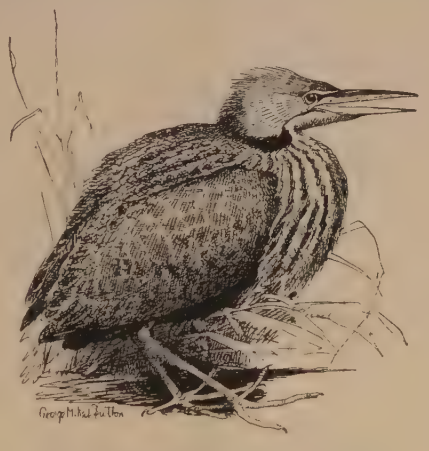
Illustrations by George Miksch Sutton

"Robert of Lincoln is telling his name,
Bob-o'-link, bob-o-link,
Spink, spank, spink."
WILLIAM CULLEN BRYANT

MANY of our words are echoes. If you are a ma-ma, a dad-dy, or ever were a ba-by you have borne an alias that is echoic. The baby has named itself, its daddy, and its mama, not only in our language, but in those of most of the peoples of the world.

So it is also with many birds. Reflect for instance on why we say "jay." Simply because the bird itself with its "jay, jay, jay," constantly dins into our ears the sound that for ages has been accepted as its name.

Numerous kinds of birds have achieved a success that is the envy, I fancy, of most of us at some stage of our mental growth—that of naming one's self. While according to the particular phase of hero worship we may have been experiencing, at a given time, such a name as Napoleon or Julius Caesar might have been our choice, at another we should have liked nothing better than William Shakespeare, or possibly Nick Carter. The birds are more conservative, however, and stick by one, or at most a very few names with repetition so persistent that man has adopted them. No one in the South needs to be told that the joe-ree, the chuck-wills-widow, and the bob-white have named themselves, nor in the North that the flicker, the phoebe, and the chickadee have invented their own appellations.



BITTERN—OLD THUNDER-PUMPER, WHO HAS EARNED FOR HIMSELF MANY DESCRIPTIVE NAMES

The flicker, yellow-hammer, or golden-winged woodpecker, is a much-named bird, some hundred and forty cognomens being applied to it, of which about one-fifth are derived from its notes. Samples of such sound words are flicker, hittock, pee-ut, wake-up, whicker, and yucker.

The flicker is the only one of our woodpeckers that has had much success in suggesting to mankind names by which it might be known, but numerous members of other bird families have notes so striking and characteristic that they have dictated the formation of vernacular names. This is especially true of the chuck-wills-widow and its allies. The whip-poor-will, a smaller edition of the chuck-wills-widow, and like it a bird of the East, seems, according to its name, to have aggressive intentions. However, out West where most other things are reputed to be "wilder and woolier," the birds of this family, in calling, omit all reference to chucking or whipping, and instead are plaintive "poor-wills."

For these strictly American birds we use the names which they themselves seem to utter. To kinds of birds very similar to those early settlers knew in Europe, the Old World names were transferred, and have become prevalent. However, even in such cases we find that the local, as contrasted with book, names of the birds are in many cases evident sound words.

The names of birds of the heron family are cases in point. The little green heron is known by such names—, almost exclusively in the Southern States,—as scouck in Virginia, scout and scow also in the same State and in North Carolina, skyow in South Carolina, and cow-cow in Louisiana. The night heron, a crepuscular flyer known much more widely by hearing than by sight, is very generally known as quawk; a similar name gawk is heard in Florida, a French version huac in Louisiana, and wop in Virginia. The bittern, another member of the heron tribe, is a shy and unobtrusive, but highly individualized bird, and consequently has numerous local appellations. Most of them allude to the bird's remarkable vocal efforts. Such names as thunder-pumper,

THE CUCKOO'S NAME IS ONE OF INTERNATIONAL SIMILARITY

stake-driver, and mire-drum illustrate names which were suggested by, although they do not imitate, sounds made by the bittern. The imitative cognomens are chiefly based on the bird's most common call "plunk-a-lunk", and we may mention as illustrations butter-bump heard in Massachusetts, dunk-a-doo in New Jersey, pum-chick in Pennsylvania, and plum-pudden in Michigan. Thus they vary.

The piercing cries of shorebirds have made their impress upon the language, such sound names as willet, curlew, and killdeer now being accepted as standard, while numerous others have local usage. None of the echoic names for our wild ducks and geese have become standard, except brant, but many colloquial terms for these birds are of imitative origin. About a dozen such are in use for the voluble old squaw alone, while an equal number otherwise commemorate the profuse vocalization of this bird. Even this duck's scientific name *Harelda* (hareld or herald) refers to its ability in "telling the world," and such names as organ duck, singing duck, old wife, and scolder, give varied testimony to the bird's vociferousness. Some of the words it uses, according to the local names, are caccawee, ha-ha-way, and kla-how-yah, all of these expressions being contributions to our language by the old squaw through the medium of the dialects of as many different Indian tribes.

THE FLICKER HAS SEVEN-SCORE NAMES, MANY OF HIS OWN INVENTION

The more sonorous utterances of our larger birds have not entirely drowned out the twitterings of the smaller species, as the names of the little chickadee, the chippy, and the pewee, prove. The towhee, joe-ree, or chewink, and the dick-cissel, the pipit, and the veery, are further examples of birds which have named themselves apparently to the entire satisfaction of our branch of the human race.

The most interesting echoic names of birds, however, are those that can be traced through languages in all quarters of the world. Truly in these cases the birds seem to speak a universal language and the fact that some race of birds with a distinctive, arresting cry occurs in almost all parts of the world, is a sure indication that most of the languages will have at least one word about the same, derived from the call of that bird.

THE CROW'S NAME IS SIMILAR THE WORLD OVER

Crows are widespread and almost universally known. They are not only strong-voiced but their caw is a sound which is fundamentally adapted for loud utterance and far-carrying. Scientific research shows there are real reasons why rah-rah's figure so extensively in college yells, though probably the cheerers themselves give no thought to such basic principles. Since this "rah" sound is the one most easily uttered in volume and strength by human vocal organs it is only natural that the caw-caw of the crow has appealed to mankind as a first rate ready-made name for the bird.

BOBOLINK POURS OUT HIS NAME IN A TORRENT OF MELODY

And it has so appealed to men of nearly all races. It is used as craw in Scotland to this day, a form to all intents identical with the Anglo-Saxon crawe from which our term crow has been corrupted. The Netherlanders say kraai, the German krahe, and their American descendants, the Pennsylvania "Dutch", kraa. In Sweden we hear kraka, in Denmark, krage, and in Portugal, gralha. Leave Europe entirely and we find such very similar sound words as kakka in India, and gaga in Malaysia. The Delaware Indians of our country called the crow aha, the Choctaws, fala, and the Onondagas, gachga. Similar terms could be cited from the speech of other races far and near. It will easily be conceded that the crow has had his own name suggestion accepted by peoples of almost every race and every clime.

One other illustration of this far-reaching principle of bird naming may perhaps be of interest. Cuckoos (our American species are familiarly known as rain-crows) occur all around the world, and apparently they must talk much alike, for the names they have been given by very diverse peoples are exceedingly similar. The ancient Greek name for the European cuckoo was coccux, and the Latin cuculus. It may be thought that the names applied to the bird in European countries are simply modifications of these parent words, but this is not a necessary supposition as we find similar words in distant parts of the world where the languages of Greece and Rome never penetrated. But all are satisfactorily accounted for on the echoic principle regardless of the history of other elements of the languages. In the so-called Romance

THE PEWEE, OF COURSE, GAVE HIMSELF A NAME

Languages the old word cuculus has been modified into cuculo in Italian, cuco in Portuguese, cuclillo in Spanish, and coucou in French. In Germany the cuckoo is the kuckkuck, in Netherlands koekkoek, in Denmark the kukker, and in Sweden the kuku. Going to a country and a people almost the antithesis in every way of Sweden and the Swedes, we find an almost identical name employed for the cuckoo, namely kukku among the Hindoos. The Maoris, that great race who peopled so many of the oceanic islands and settled New Zealand, called the bird koekoea, while in our own country the Natick Indians of Massachusetts named it kookkook.

THAT THE CHEWINK HAS NAMED ITSELF IS PLAIN

Nothing is clearer than that the tracing of names of cosmopolitan groups of birds soon gets us to running in circles. We can hardly be sure from the form of one of these names in what part of the world it is used. If it is kookkook in a native American tongue, and koekkoek in Holland, the poor bird can hardly know whether it is a Dutchman or an Indian. But hold, that is not the secret; the real explanation is that all of these as well as the other races named, are cuckoo, at least in part. We are speaking lingualistically of course, not psychologically.

Supercilious humans have denied that birds have language or anything approaching it. However, it is clear that they not only have language of their own but have contributed largely to ours. Besides many of their own names they have given us a variety of other words as caw, chirp, cluck, coo, honk, hoot, peep, quack, squawk and trill. When we reflect on how many similar words there must be in all the languages of all the peoples of the whole world, and further how many names of birds in all these languages have been derived directly from their own calls, it is evident that the words birds have contributed to human language can only be measured in thousands. Not only do we have many bird-made names, but we use much bird talk every day.

A Tree Murderer

by E. H. Mears

A MORETON BAY FIG TREE

A tree in the Bunya Mountains, showing a remarkable height of network

The Moreton Bay fig is a murderer of trees. Like most criminals this member of the plant world is abnormal. Unlike most plant forms it does not start its life in the ground. Instead it may first be seen as a tiny vine clinging to the bark of a friendly but fated tree, the seed having been carried and lodged there by the wind.

From this small beginning the fig vine sends out a runner to the earth, where it takes root and in turn sends forth fresh vines. These twist and climb around the tree like a network, enclosing it in a close embrace. Once firmly established, the fig now has little use for the support that gave it early life. Slowly but surely proceeds the strangulation of the victim tree. In time the host dies and rots away, leaving the victorious fig in entire possession of its site.

CAMERA HUNTING on

or

"Getting Your Goat"

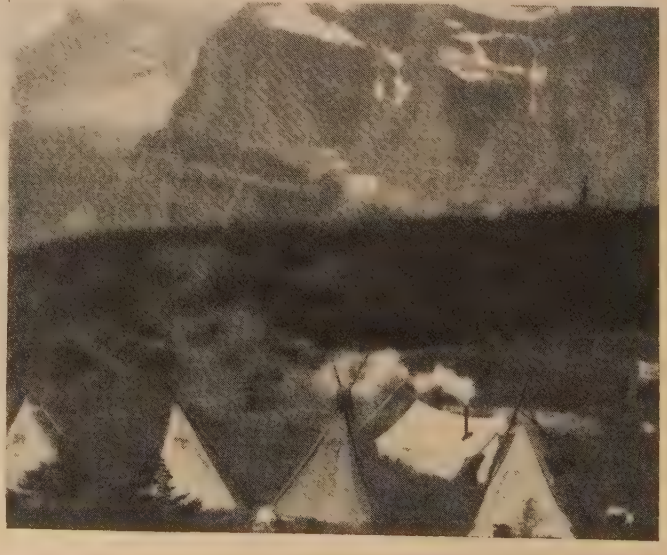
This is the second installment of the story of the Pack-Finley camera hunting expedition in the northern Rockies. This month we find the party on top of the Continental Divide on the very border between the United States and Canada, where were taken the most successful mountain goat pictures that the editors have ever seen.

"TO CATCH a mountain goat you've got to be one yourself," is an adage well known to big-game hunters who have attempted this most thrilling and strenuous sport. Rocky Mountain goats, which are not really goats at all, but a species of goat-like antelope related to the Alpine Chamois and the Himalayan Serow, are growing scarce, in spite of the fact that they inhabit almost inaccessible places. Within the protected area of Glacier National Park, however, there remains a very considerable number, widely celebrated because of their pictorial prominence upon the freight cars, menu cards, time-tables, and what-nots of the Great Northern Railway. These advertising portraits may be readily studied by tourists and tramps alike, but in the wild confusion of Nature within the Park, as elsewhere, one usually needs a good pair of field glasses, a certain training as steeple climber, or a sprinkling of plain foolhardiness or luck to get within smelling distance. I use the latter term advisedly because mountain billies, like civilized goats, possess the ability to create strong olfactory reactions.

Bill Finley had hunted mountain goats with a camera for several years, but in spite of his claim to being the champion photographer of American wild life he had nothing to show for it but an unsatisfied longing and an acquired taste for walking on the edge of nothing, which taste the rest of us shared only with distinct reservations.

"Well, sir," remarked Jim, as we clustered around the cook tent in the chill mists of early morning on the day following a long trek over Boulder Pass, "how about gettin' up close to some old billies today? Them goats we seen yesterday must be on the other side of that mountain and we got the

(Left) HE'S OFF
The goat picks out a nice soft cliff below on which to land and launches on his way downward



THE CAMP
The Expedition sets up its tepees and makes camp in Brown's Pass as a base for its work

the Continental Divide

by Arthur Newton Pack

Photographs by William L. Finley and the Author

chance of our lives and that camera. It's quite a hill but we can make it."

The mountain in question was a long ridge of varying height crowning the Continental Divide between Brown's and Boulder Passes, but the lowest part of the knife edge frowned down upon us from some thousand feet of shale slides and rocky abutments. Yesterday and on many yesterdays we had gaspingly sneaked and scrambled up such precipices only to turn disappointedly down again as the watchful goats nimbly shifted into high and vanished from sight. You simply can't catch a goat from below, for his sight is keener than yours. Calmly he will watch you from above and then simply disappear. Your next glimpse of him is likely to be on a summit half a mile away.

Had not President Roosevelt said that if you could once get above a goat he was "as crazy as a fool hen"? So Jim Whilt, Bill, and I wiggled into our camera packs and started slowly for the top of the world. Although there was no trail, still the way did not look so difficult from below; but as we climbed it became steeper and steeper until at length we halted—panting—for the dozenth time beneath a wall of rocks that seemed insurmountable. Then taking the icy shower of a waterfall full upon our bent backs, we ducked beneath the rushing torrent and came out upon a great slide of loose shale, up which one could clamber doggedly—using hands as well as feet. For every foot upward we would slip back six inches, but our net progress was at least sure. Two hours later we reached the top.

Before us a great moraine of tumbled blocks ended in a great snow bank crowning the top of Hudson Glacier, and the icy wind bit through our

(Right) LANDED
With the unerring skill of his kind the mountain goat lands on his selected rock cleft

EN ROUTE
The trail of the Expedition leads across the snows that cover the floor of Boulder Pass

GETTING HIS GOAT

Mr. Finley trains his motion picture camera on the goat

perspiration soaked clothes. We looked ahead and down, down endlessly into an abyss walled with almost sheer rock; down, down to glimpse two spots of unbelievably blue water, dashed with the rich cream of glacial silt. These were the North Lakes, headwaters of Boundary Creek; and, away to the north, range after range of mountains mounted guard—giants of the Canadian Rockies. The water of those lakes we knew drained eventually into the Saskatchewan, and after more than a thousand miles of wandering found its way into Hudson Bay. We stood seemingly upon the upturned blade of a giant's knife, ground roughly, as a sharp knife edge always appears under the microscope.

Jim suddenly grasped my shoulder. "Look at the old nanny!" Even his voice was husky with excitement. Just below us on a narrow ledge sauntered unconsciously a goat, her last season's wool hanging in shreds about her shoulders. She looked as if she had just come out of a rag bag. The temptation was great; and, although we were doubtful of the popular saying that if you roll a rock down at a goat he will come up, Jim pried loose a rock and let it roll.

"Look at her! Look at her! Look at her!" shouted Bill, as the old nanny plunged along the face of the cliff at an almost unbelievable speed. She galloped over boulders and jumped from foothold to apparently no foothold at all; but she did not come up. Then, beyond her, we saw two more goats. They must have been hidden just beneath us and had come out to see what the disturbance was all about. Bill and I swung into our packs again and began to work back and around in a great circle for closer view. It was a laborious process. After making sure that we had gone far enough along the top of the ridge, we began slipping and sliding down the sixty-degree slope. Safely beyond the place where we supposed the goats to be, and hidden from view by a sort of rocky chimney, we unshipped our packs, took out our cameras, and feverishly affixed telephoto lenses. My trembling fingers somehow bungled and a lens cap slipped from between them to bound down the mountain and be lost forever in the depths below. Ready at last, we thrust our heads cautiously around the rock chimney. Glory! There stood the two Rocky Mountain goats not more than fifty feet away! At that very instant Jim, who had remained behind, rose up to signal, waved his arms, and emitted a yell. The goats saw him and plunged right towards us. They were almost on top of Bill before they saw him, for they had not reckoned on another human being so near. They wheeled. Right down the face of the cliff they bounded, and I barely had time to snap a single picture.

It was then that Finley and I realized how far we had slid down the northern side of the Divide, for it was a long way back, necessitating a climb between the upper edge of the glacier and a wall of rock from which the reflected

(Right) "LOOK AT HER", SHOUTED BILL

The old nanny plunged along the face of the cliff at almost unbelievable speed

CAUGHT! ONE CONEY

His little round ears, rimmed with white, and his beady black eyes were all alert and inquisitive

heat had melted the ice. At last, on the top of the Divide again, we debated as to whether we should pursue these goats farther or go back along the knife edge and pursue a big billy that we could just make out with the field glasses. The latter counsel prevailed; but we had hardly covered two hundred yards when another billy casually walked up to the very spot where we had been holding the discussion.

As we scrambled along the ridge and rejoined our guide for a bite of lunch, we could see on our left the tiny white dots that marked the tops of our tepees down in Brown's Pass. I remarked that I thought I could heave a rock right into camp. "That's nothing," said Jim. "I could spit right onto the cook stove."

Meanwhile a number of goats appeared near the top of another ridge of the mountain, within easy view of our field glasses. As we watched, a great golden eagle sailed over us and swooped towards the goats. Like a flash they bunched together to protect the kids and offered such an array of horns and heads that the eagle sailed upwards again, waiting for another chance. Again he swooped at an old nanny and kid near the outer edge of the group. She rose on her hind legs to strike out at him and he turned suddenly in the air to soar upwards once more. As far as we knew that particular eagle got no young goat for dinner, but doubtless the Rocky Mountain goats are far less numerous than they would be were it not for the kings of the air, who are always on the watch for them.

Presently, bolting a large mouthful of sandwich, Jim remarked, "Look a here, Bill. We can get them goats easy. All we have to do is to climb up that there chimney and we can walk right up to 'em." Bill, however, was both hungry and skeptical and finished his lunch leisurely. Then, while Jim champed at the bit, Bill extracted from his pocket one of those pieces of old rope which he calls a cigar and completely burned it by the forced draught method before he was ready to start. I had had enough climbing for the time being and watched them doing the reversed Santa Claus act up the rock chimney, hoping that there would be no mishaps to frighten the goats. Suddenly something happened. Bill's foot slipped and a block of stone rolled over the edge and began its bumping, crashing descent. Surely it would stop at that next ledge and hold; but no, it turned over just once more and crashed down another fifty feet, hesitated, caromed off upon a slide of shale, and tumbled down, down towards a saddle. Even here there seemed to be no rest for that particular piece of granite, for—with its corners broken from its many bounds—it rolled over the edge of another slide and began the apparently endless voyage down to the lake. Perhaps miniature landslides are so common that the goats become hardened. At any rate, although we held our breath, the animals only moved to a lower ledge and unconcernedly resumed their afternoon meal.

THERE SHE IS
The author and Mr. Finley spot their goat quarry

(Left) WHAT'S A CLIFF TO A GOAT?
A nanny taking her constitutional up an apparently unscalable cliff

A PTARMIGAN
Bill chased a scolding mother bird and finally photographed at a range of three feet

A MOUNTAIN GOAT YOURSELF

That is what you almost have to become to catch these acrobatic inhabitants of the cliffs and crevices on the film of the camera. Here is an idea of man and beast climbing cliffs. Who seems to be the more footsure?

A ptarmigan whirred out of a cleft in the chimney where Bill's red socks marked him against the gray and brown background. Fifteen minutes later I was arrested by a cry from the mountain side. Bill and Jim had clambered down to the edge of a rocky palisade which they could not descend without ropes, and clearly desired advice as to how to proceed. There was a slide somewhat to the northward and I signalled them to go in that direction. Presently Jim appeared to be following the advice, for he scaled the edge of a rock and disappeared from sight. Bill, however, kept working back and forth on a narrow ledge and seemed to have lost his wonderful nerve. Ten minutes passed and still he worked around in circles without getting anywhere. Was he stuck? How could I get word to the guide to go back and help him? Shouts brought no response and the situation looked serious. Another five minutes went by, and then Bill Finley disappeared altogether. My brain worked feverishly. How could we get the body back to camp, and how could the remains of our star photographer best be transported to Oregon? Then suddenly Bill and Jim appeared together on the slide and a few moments later they came slipping and sliding down. Bill, mopping his brow, casually remarked, "Gee! I got some wonderful shots of those ptarmigan!" Indeed his circles had been in pursuit of a scolding and flopping mother bird which he had photographed at last within three feet.

A long way down to the right we saw an old billy alone and we climbed down, approaching cautiously. He seemed puzzled at our approach from above and did not know what to do. Finally he lay down on a projecting point where he had a full view in every direction. We halted on another projecting ridge, hiding behind a

AND THIS IS WHERE THE MOUNTAIN GOATS LIVE

Such panoramas as this greet you as you rest your eyes from seeking goats

JIM SPOTS HIS GOATS

Our versatile guide balances atop a pinnacle and scans the country, and finally sees the agile goats

rock, and held whispered consultation as to how we might sneak nearer without being seen. Finally Bill cut some bushes and a dwarf fir, held them in front of him, and—going down on his hands and knees—crawled straight towards the old goat. Jim was some distance below on another ledge, and we knew that the billy must be watching him, for the animal kept looking down, although glancing occasionally at the bushes and legs that were moving nearer and nearer. Thirty feet farther Bill braced himself behind a rock and his camera buzzed. The old goat looked up curiously but unafraid. Just then I caught sight of two nannies—each with a kid—about to cross a snow slide towards me. One nanny stepped out onto the snow, then caught sight of Bill and stopped. Her kid, not scenting danger, forthwith butted its mother in the hind quarters and wiggled beneath her, hungrily demanding dinner. He was not to be satisfied, however, for she quickly wheeled, and all four goats trotted up the steep side of the mountain where it seemed almost impossible to go. They soon reached a shoulder and disappeared.

A rumble of thunder caused us to glance off to the north to view a marvelous sight. A thunder storm had drifted up the valley of Boundary Creek and was rapidly filling the chasm. The clouds whipped the wind against the foot of the mountain, swooped upwards at us where we stood. We had a few moments for some quick work at scenic effects and then an ocean of clouds poured through the little gap to which we had made our way, shutting out the glacier at our feet, shutting out the sun, shutting out each other, shutting out everything. Suddenly a streak of lightning shot from the north and the inexplicable terror of the high mountains seemed to grip me. In jumping from one rock to another I slipped back ten feet and my nerve went. "Bill," I called. "Bill, where are you?" A shout came from close by and Finley, reaching out a hand, drew me beneath the shelter of a great slab of rock. The comfort was about equal to that on top of a picket fence, but we covered ourselves as best we might and lay still.

Presently, from back under the rock came a plaintive "e-eh", the bleat of a coney. Bill squeaked in reply and a moment later the bleat came from the other side, and I saw a gray streak coming towards us. On it came. We lay perfectly quiet. Then apparently for the first time the little coney discovered strange changes about his home—a knapsack and a hat. He came within four feet and looked into strange eyes; then he bobbed under a rock and came out to discover a pair of heavy boots at his back door. His nose twiddled; his little round ears, rimmed with white, and his beady black eyes were all alert and inquisitive. He darted over to the other end of the rock and sat wondering how it all happened.

Sure now that the storm would last, there was nothing we could do but slide off on the camp side and make for the shelter of our own tepees. "Let's go!" yelled Bill, and he began to swing into his pack. A moment later, "Where's Jim?" I called. The clouds lifted a bit at that instant and a hundred and fifty yards down the slope we saw the stunted top of an alpine fir violently agitated. Jim was on his way. We followed. Soon we came out on the upper edge of a tip-tilted meadow covered with slippery bear grass. We sat down—not deliberately, but firmly. It was impossible to persuade our feet to wait for us; but the wet bear grass made a nice cushion and had just the right amount of friction. "I've got an extra pair of trousers," I thought, "but I haven't got an extra pair

"SEE WHO'S HERE"

The goats take a peek around the cliff and spy the two-legged invaders carrying black boxes

of legs if I try walking down this." Even as I came to this decision, I shot by Bill to bring up in a goat wallow —a sort of level resting place which the goats apparently kick out with their feet. Bill said he had seen a goat making one the day before. The rest of the trip down to camp was a series of posterior progressions, interrupted at intervals by ledges of rim rock down which we clambered by way of one of the innumerable stream beds. When we got up too much speed on the lower reaches, we would reach out and grasp the flowering spires of the bear grass, which furnished just the right amount of brake. The storm came down the mountain close behind.

As we stumbled into camp and made for the warmth of the cook stove, we discovered Jim already steaming before it, the light of relief in his eyes. "Well, sir," he observed, "I guess we're the goats all right."

The SPHINX CATERPILLAR

CORNELIA CLARKE

SPHINX CATERPILLARS AND MOTHS
Above the moth and pupal shell are about two thirds natural size with the caterpillar much enlarged

INSECTS are absolutely helpless and at the mercy of man as far as their names are concerned. Sometimes their names are prompted by the colors of the insect, or it may be a food plant or feeding habit that suggests a name. Again it may be the appearance or action of the insect, or its fancied resemblance to something else. This is the case with that interesting family—the Sphinx Moths or Sphingidae, whose infant or caterpillar stage suggested their family name.

When at rest the caterpillars have a habit of elevating the head and first few segments in a curved position, the whole body then forming a posture somewhat like the letter S. This attitude excited the attention of insect describers who had no difficulty with investing these caterpillars with the majesty of the Egyptian Sphinx.

A possible explanation for the Sphinx caterpillar's habit of remaining motionless in this manner for considerable periods, is safety first. They are camouflaged by their protective coloration, but birds and other enemies are ever on the lookout for moving objects that might furnish a dainty meal.

Many Sphinx caterpillars are peculiar in having a curved horn on top of the hind end of their bodies. This horn is not a stinging organ, and they may be handled with absolute safety. Nothing could be more harmless than these creatures, in spite of the stories told of their poisonous and venomous qualities. Their whole desire and object in life is to eat vegetable food and grow up. They are all external feeders on various plants, and they must consume great quantities of leaf and stem to furnish energy and tissue enough to carry them through the quiescent or pupal condition, and until they reach the final adult or moth stage.

A FASCINATING, RAMBLING GARDEN
In this case the curbings are of tile and lend delightful color to the garden itself

RELATING HOME and GARDEN

Some Thoughts on Planning the Garden in Harmony With the Home

by Estelle H. Ries

EVERYONE loves a garden, and at this season particularly, the urge is strong within us to improve the outdoor surroundings of the home.

Every house requires a setting, but if that setting is not considered with reference to the architecture of the building, it cannot expect the success that such consideration would give. The characteristics of site and the style of the building must both be studied so that an intelligent scheme for the entire ensemble may be devised. Just as the modern home-maker knows approximately the complete plan of furnishing she expects to pursue in any one room before she buys a single piece, so, too, the modern gardener. After the plans are made, they may be gradually developed over a period of years, and each step will prove an advance toward a consistent and harmonious goal. The hit and miss method is no longer countenanced among those who really care.

The architectural aspect of the building should dominate the planning of the garden, and certain characteristics suggest either formal or informal treatment. While Italian and French types require a rather formal arrangement, the informal is identified with English. If a house is symmetrical and dignified, it wants a balanced approach. Is it irregular? Then the planting should match it. The square substantial house of the New England Colonial type should not attempt to snuggle among shrubberies. The feature of a Colonial house is the fine type of doorway that dominates it, and the entrance path should be straight and leading to it directly. But a cottage, on the other hand, rather craves accessories. It seems to belong wreathed in vines, with shrubs nestling about it, and its most delightful characteristic is the resulting intimacy.

GAZING GLOBE IN THE GARDEN
It is a mirror of the outdoors, especially beautiful in early evening

The country house should not only appear to be an inseparable part of the general landscape, rising logically from the land, but should especially form a complete picture with its own grounds. To effect this, each portion of the grounds must be interrelated with every other. House, gardens, shrubbery and walks must fit together and be of one spirit, each part subordinate to the interest of a harmonious whole. It is not enough to scatter trees, shrubs and flowers promiscuously over the place, for this shows no central idea and betrays a lack of creative ability. The plants selected should be chosen not primarily for their individual beauty but for their relation to the whole design. It is in-

AND A BIRD BATH ALWAYS
Bird visitors are the soul of the garden and their comfort should be considered

deed tempting to ignore this injunction. One reads so many alluring descriptions of various plants that one is apt to forget the picture—to emphasize the parts and neglect the composite effect. All sorts of inharmonious and unrelated incongruities thus arise.

So then, do not plan the garden for the cultivation of the individual flower, shrub or tree. Horticultural flowers that take prizes in exhibitions serve no purpose in the garden, for one individual chrysanthemum, even if it were the largest or best that could be cultivated, would in a garden serve but as one single note, and, unrelated to its surroundings, would not be a composition but an isolated element or spot. If individuals are wanted, place them in a greenhouse where they can secure better care and not dominate where there should be no domination. Neither should flowers be planted where they will look weak or frail. No thin row of small flowers, be it ever so exquisite, belongs at the base of a building that is massive and heavy.

The smaller the place, the more important not to clutter it or make it spotty. Shrubs should be planted to serve real purposes, not to fill space and break into the lawn arbitrarily. The house cannot be successfully united with the ground simply by growing things beautiful in themselves, but only by the use of such as will harmonize in line, color and tone. Bushes may be grouped near the house to conceal an unattractive outlook or to screen a porch. Evergreens make ideal screens because they are effective at all times of the year. Shrubs hide a foundation better than flowers which die down for half the year and are often too small anyway. A bush, pink in flower, will offend a red brick building. Large, striking bushes do not go well with a little low cottage, so that in this, as in all the arts, both color and form are the two prime factors in securing a harmonious result.

Before planting has time to mature, and when the house is newly built, vines may be used with good effect to unite the house with its surroundings. They are quick to respond, and a house need not look the hard, uncompromising thing it is without their kindly aid. They may be planted as soon as the outside of a building is done, and need not wait for any other ground plan to be developed. Here again, the architecture of the house should be considered. Vines that grow in narrow vertical strips should not be selected for a rambling, horizontal house. Ivy is the most formal type and goes well with the residence that is of ambitious or pretentious character. For mere convenience it is usually better to have leafy green vines attached to the house itself instead of flowering climbers that tend to litter the ground with petals and attract insects. Most people, however, are willing

THOMAS ELLISON

TREES AND SHRUBBERY ATTRACTIVELY PLACED
An instance of a more formal treatment of the approach to and setting of a large estate at Williamstown, Mass.

to bear these slight annoyances for delightful wisteria, honeysuckle or nasturtium when properly employed.

Flower beds are not usually an advantageous scheme of planting, for nearly eight months in the year they are brown, unsightly objects to break up the lawn space. Flowers might better be planted near the house against a background of vines, or in border beds with shrubs behind them. Thus they will be better supported in season and less conspicuous out of season. But the fascinating question of flowers will be the subject for a later article and will not be developed here. It may however be stated that a detached house is best not located centrally in the width of its plot. It is preferable to place it so that the widest space is on the sunny side for thus far better success with flowers is made possible. The obsession for symmetry is not always justifiable when grass and gravel are allowed to usurp positions best adapted to flower culture, while long stretches of border in perpetual shade try futilely to grow a few starved plants. The question of exposure should be settled before anything is done about laying out the garden, or indeed the house itself. For instance there is the matter of the fore-court. A fore-court is always desirable, if only to assure privacy and keep the dust of speeding motor cars away from the immediate entrance. The house with a northern exposure, however, will cast a shadow upon its fore-court that will make flower-growing difficult, and its size should be limited to just the space that will serve the purposes stated. On the other hand, if it has a southern exposure, the fore-court may be extensive, for where flowers will grow about the house front, they are a charming addition to the graciousness and beauty of the home.

Until there are some trees on the grounds, most people, and properly, do not feel that their housing problem is settled. It is a common error, however, to plant them too close to the house itself. When this is done, one finds dark and damp rooms in the upper stories from which air and light have been excluded. The object of shading the house has been defeated, as the shadow is cast upon the house itself instead of upon the lawn which reflects the sun. Then, too, the tree itself will look crowded and ill at ease, and its spreading roots will cause mutual irritation to the tree and the foundation of the house.

SIMPLE GARDEN SEAT AND TABLE

Comfort should be considered in selecting the seat, and simplicity, as well

A large variety of trees of different species should not be planted unless there is room for several of each. To do so is to produce a stringy effect that will not group, and it is never so found in Nature. One may successfully group different varieties of the same species, like evergreens or maples that have features in common. There need never be doubt, however, as to what may be grown in certain localities, for there are books and books of

THOMAS ELLISON

CHILD STATUES IN A LUXURIANT GARDEN

Playful little children, even of stone, are perhaps the best company in the way of garden sculpture

expert suggestions based on the ripest experience, telling what trees, shrubs and flowers grow best in sun, in shade, in dry or moist places, setting forth to what heights they grow, in what seasons they flower, when they bear fruit, what conditions they require, and all their needs and habits.

It takes tens of years to develop some of the slower growing trees, like oaks or elms, to maturity, and if one is fortunate enough to find one on his grounds, it is a rule without almost any exception that it shall not be cut down. It is almost always better to adapt the planting and the building of the house itself, to trees already on the ground, than to adapt the trees to other conditions. There may, of course, be circumstances where from every viewpoint it seems necessary to tear down a tree, but unless it is absolutely necessary and there seems no alternative, it may, on the advice of experts, be considered. Trees give value to property for their sightliness, for shade, for absorbing excess moisture, for affording refuge to birds, and as a monument to the inscrutable ways of Nature. They should be regarded as a heritage to be loved and preserved even at the expense of some other desire.

In the work of developing your home and its garden surroundings let Nature Magazine help you. Advice and references to sources will be given with pleasure.

For a two-cent stamp members of the American Nature Association are entitled to the following helpful bulletins: No. 21—Tent Caterpillars and Their Control; No. 22—Tree Leaves, Their Story; No. 28—Bringing Up the Puppy; No. 29—Some Advice on the Home Aquarium; No. 31—Planting Your Bulbs; No. 32—Gardens Under Glass; No. 33—With the Aid of Lattice.

For the treeless grounds, it is well to know that one does not have to plant a tree that takes decades before it comes to maturity. One may purchase trees and bushes from nurseries and have them transplanted to one's own garden and located there with the best artistic effect. The low prices at which such trees are obtainable make it unnecessary to tolerate any barren ground. The view of a country home from the road may be framed by the deliberate placing of trees in such a way as to form an opening through which to look. Since the house is first beheld ordinarily from a roadside or other approach, its setting with relation to that approach is one of the first things to be thought of. Where the grounds about a house are extensive, one may arrange the approach so that the house will first be seen from the point at which it appears to best advantage. If one sees a house from a considerable distance, it is likely to look small and insignificant. If one turns a corner, exposing the house suddenly, the approach is unpleasant because of its abruptness. Of course the grounds should not only be pleasing to those approaching from outside, but their planting should be considered with reference to the views from the windows of the house as well.

The alleged need for grading the grounds is something that has been greatly overestimated. Many natural beauties and irregularities, which would with proper treatment make for something distinctive and individual, are erased and standardized into a commonplace flat spot like every other commonplace flat spot. Where an eccentricity exists in the site, experts urge us to go further than accepting it in a spirit of resignation. It should be regarded as a feature, a nucleus for development, and the plan of the house and grounds should be developed to emphasize and feature it. If the site is low and damp, do not lament over it. Rather dig it out a little deeper so that the moisture will collect in one place, and have a little pool. This affords a bathing place for birds, an opportunity to grow real aquatics and other damp-loving things. Water in the garden opens up great possibilities in the treatment of the grounds, since green things thrive especially well with it. There is the further attractiveness in the many sounds emanating from it and the reflections that it casts. The treatment may be either formal or informal, according to the spirit of the house, but at all times the water should be kept in motion and debris or stagnation guarded against.

Too many walks should be avoided in the garden, as they break up the area of the ground into useless units instead of leaving it a harmonious whole. Ground space is always an asset and it is thriftless to have more walks or drives than are required.

The garden should be looked upon as an outdoor extension of the house, and unless the garden is walled or somehow bounded, there is not enough privacy to enjoy it as an outdoor living room. Fences must conform to the character of the house they are to confine. Small hedges are a weak border for stone buildings and large grounds. Wire fencing is out of scale with buildings of masonry. Iron fences do not belong around a shingle cottage, but all of these may be used with excellent result if the right type is chosen for the right place. Garden architecture must reflect and be consistent with the architecture of the house.

This is true in all the details, even down to the pergola where there is one. Those of classic design cannot feel pleasantly disposed to a rambling, careless little bungalow, nor can a rustic pergola rise to the dignity of a Georgian mansion. The pergola has for its purpose to support vines and to provide a pleasant shady walk, leading logically from one place to another. But there is no reason for its existence where there is no vine for it to support, or no destination for it to lead to as a fitting transition.

The most desirable, intimate and comfort-giving feature of any garden is the garden seat. Without it, the outdoor living-room aspect is entirely lost, as one cannot comfortably read or talk in the open for any length of time without seats, thus depriving oneself of the chief advantages of having a garden. The two essentials in locating a seat are a background to give a feeling of security and a foreground to hold the attention. It should not be placed in uninviting or isolated spots or unprotected open spaces. Garden seats should be chosen for comfort. The narrow rail-bottom, rail-back chairs are never that. Nor is the so-called rustic seat with its hard knots and uneven knobby parts. A smooth seat, firm balance, and an easy, smooth reclining surface for the back are essential, and in no way less picturesque than the uncomfortable types. Selection of garden furniture should, therefore, be given as much thought as the choice of the growing things of the garden. There are reliable and competent manufacturers of this outdoor furnishing and one has little difficulty in finding "just the thing."

R051
vol. 11

GATHERING THE "WILD" OYSTERS
Pollution, however, is threatening our sources of supply

23

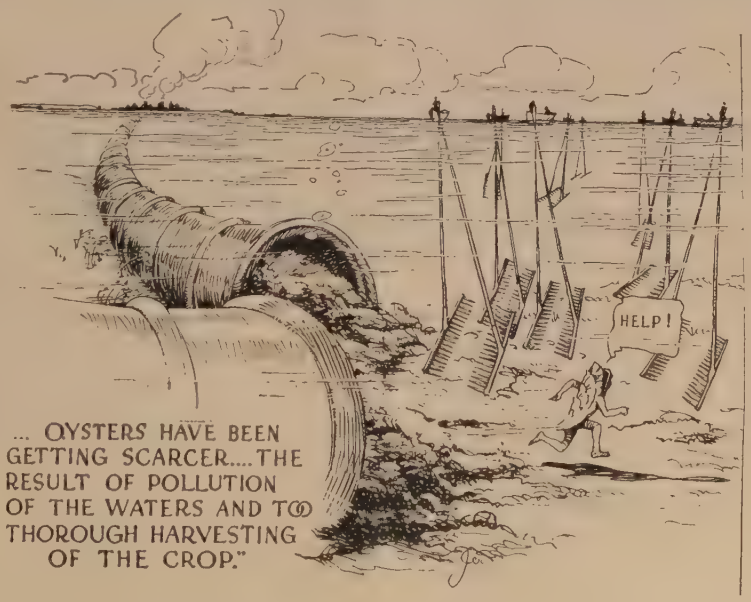
OYSTERS *of the* BLOOD ROYAL

Taming the Retiring Bivalve Holds Promise of Saving the Industry

by Ernest S. Clowes

THOROUGHBRED oysters are now a possibility. Scientists of the New York State Conservation Commission, having perfected methods of breeding these popular denizens of the deep, have made possible the raising of oysters whose pedigree is known. With further application of the method to commercial oyster culture, the time may come when a Blue Point or Lynnhaven Bay bivalve will mean just as definite a type of size and flavor in oysters as Rhode Island red does among chickens or Northern Spy among the nobility in apples.

What is more, it has been found that hand-raised oysters show some domestic traits that are rare among the wild varieties. Anybody who has ever tried to violate an oyster's impenetrable reserve has soon discovered that some may be made to open up much more readily than others. This trait depends to a great extent on the shape of the shell. In these newly-developed tame oysters this is much more symmetrical and regular, affording also for those who like them on the half-shell a cupped shell deep enough to hold the shy and restless creature and prevent his too-easy escape from the oyster fork.



"... OYSTERS HAVE BEEN GETTING SCARCER.... THE RESULT OF POLLUTION OF THE WATERS AND TOO THOROUGH HARVESTING OF THE CROP."

The taming of the wild oyster is one of the greatest recent triumphs of science. Although it had long ago been found possible to gather up "seed" oysters from the natural beds where they were found and to transplant them to other more convenient beds for cultivation to marketable size, no way had been discovered of artificially fertilizing the hundred million or so eggs produced in one season by the female oyster and of raising them to maturity. The fertilization itself was not so difficult, and a way to do it similar to that used in fish culture was discovered decades ago; but there science ran up against an obstacle not to be overthrown until recently.

The trouble was that the little embryo oysters were so small that there was no way of renewing the water in which they lived without their getting lost in the course of the process. They couldn't be strained out for they were so tiny they would slip through the finest screen, and yet if the water was not changed they died.

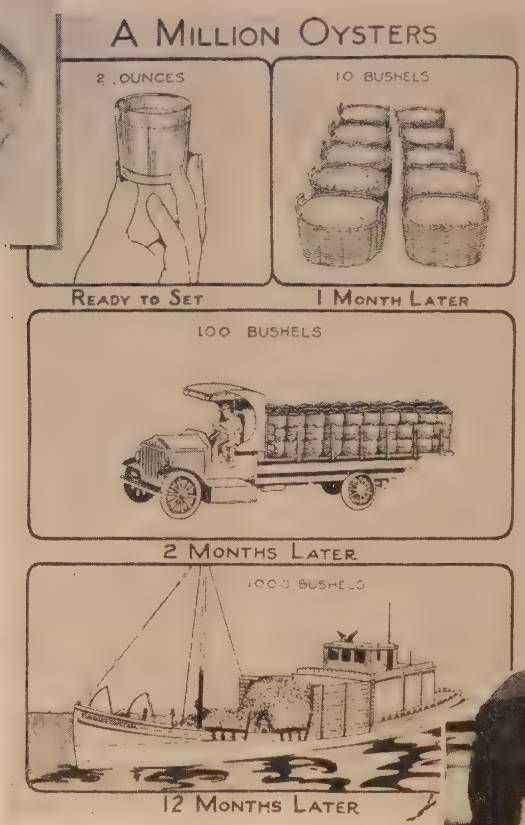
But a scientist with imagination enough to link up oysters with the dairy industry—perhaps he was fond of them creamed—thought of using a milk clarifier to sort out the immature oysters. In this device the milk is whirled in a revolving cylinder so fast that the particles of dirt fly off to one side and

the clean milk flows out through the bottom. When water containing oyster embryos was given the same treatment the little oysters were flung off to the rim of the vessel and from thence transfered to fresh water and fresh food.

The next thing to do was to find out if these little unattached oysters would settle down in life as any respectable oyster should if they were given a good opportunity. For until he is a few weeks old the oyster is a roving creature. The wide, wild waves are his home. He is a drifter, a tramp of the seas. Then, as he grows up, he feels a desire to have a home of his own, to settle down, acquire a home and a family. If left to himself in the open bays he finds ways of doing this, preferring to attach himself to rough stones or broken shells. The questions was, would he do it in the laboratory?

(Above) HOW THE OYSTER GROWS

Shells showing one season's development,—top row, April; middle row, August; bottom row, November

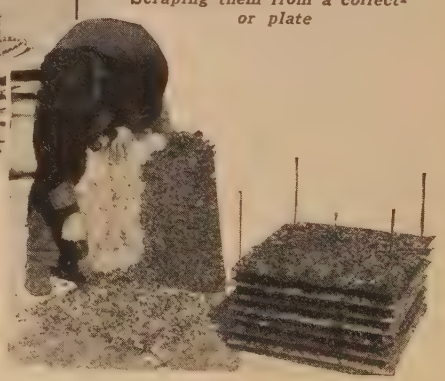


TWO OUNCES TO 1000 BUSHELS

Showing increase in bulk from egg to planting stage

(Below) GATHERING THE YOUNG

Scraping them from a collector plate



He would. Raised to the proper age the little oysters, or "spat" as they are now called, fastened to the sides of the jars in which they lived as if they intended to spend the rest of their lives there. Meeting them halfway the scientists then provided slabs of ordinary asbestos cement roofing tile for them to colonize, a device that so pleased the oysters that they settled down like flies on a sheet of flypaper. There they thrived and grew and when autumn came they were fully developed "seed" oysters, ready to be scraped easily from the tile plates and planted on the beds where they were to mature.

The whole life-stage of the oyster has been carried on either in the laboratory or in experimental tanks up to the stage of planting of the seed, and oysters raised from this domesticated "seed" have been matured and eaten.

The purpose of all this scientific work was not mere curiosity, nor a desire to raise tame oysters as companion pets for goldfish. It had for its aim the actual saving of a great industry and gastronomic delight. As people who have had to buy them have long known, oysters have been getting scarcer. This has been largely due to the scarcity of seed oysters, which in turn was the result of pollution of the waters and too thorough harvesting of the crop. If it were possible for oysters to be started in life under artificial conditions and then transplanted to the sea the industry had little to fear, for one female oyster produces some hundred million eggs in a season. Under natural conditions, only a few of these survive to maturity; under the unnatural conditions of our sometimes polluted seed beds, fewer still. Science has now made possible the salvaging of as much of this oyster life as may be needed. The cost as yet is relatively high but it is bound to be lowered and the time to come when a large part of our oyster crop will be artificially hatched.

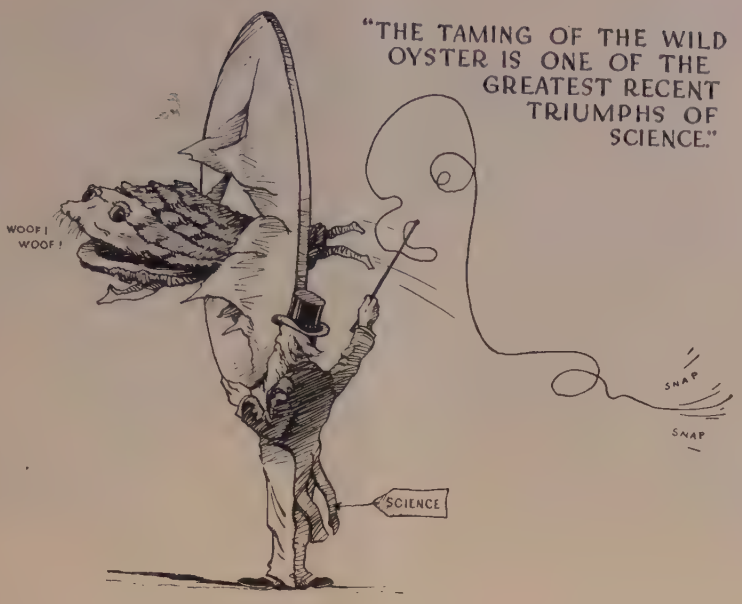
More than that is possible. Eggs from one female oyster may be fertilized by one male and a pedigreed strain produced. Following universal experience it is expected that variations from type will occur in conformity with the known laws of heredity and that new types of oysters of desired form or flavor may be developed. It has already been noted that these domesticated oysters show a much more regular form than the wild variety. The process is, moreover, not restricted to oysters but may, it is thought, be extended to clams, scallops, and other shellfish, all of which may be similarly bred.

One extraordinary feature of these tame oysters remains to be noticed. Some of these "hot-house" bivalves seem to have somewhat lost their power of attachment to

objects. This say the scientists of the New York Conservation Commission, raises the question as to whether they may perhaps not represent a throw-back to an early ancestral type, which at this same stage of growth possessed a foot.

Shades of Lewis Carroll! For did he not write those immortal lines about the "young oysters" whose

"shoes were clean and neat;
And this was odd, because you know
They hadn't any feet."

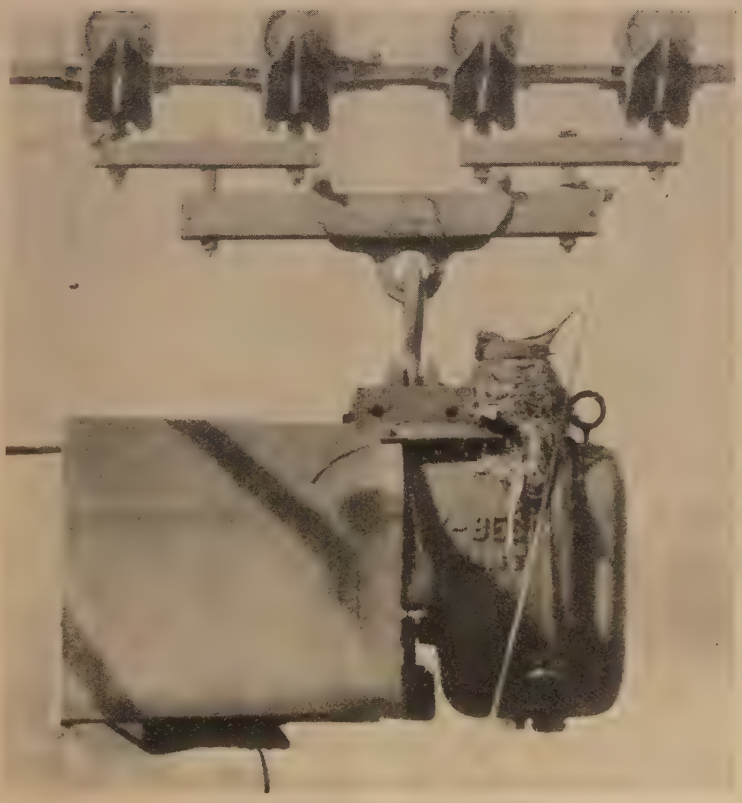


And now comes William F. Wells, who did most of the original work in the "taming" of the oysters for the New York Commission and who ventures to say that it may happen that science will yet produce an oyster with at least one foot. As to shoes, on that point science is silent.

A TRAVELLING HOME SITE

by Nevin O. Winter

EVERY effort has been made by the DeVilbiss Company of Toledo, Ohio, to cultivate bird friends. The attractively landscaped grounds have bird boxes and feeding stations that are quite popular. A robin, however, looked over the housing situation carefully and, disdaining these home sites, flew around to an automatic electric ash hoist and inspected it. This piece of machinery lifted ashes from the basement, carried them along a track and dumped them and was not frequently visited. In fact, when workmen noticed the robin family's choice of a home, the nest was already built and the mother was sitting on it.



THE ROBINS SELECT A HOME
A Toledo pair built a nest and raised a family while an ash hoist travelled to and fro

A council was held, at which Mrs. Robin looked scornfully and budged not an inch. A report of the situation was made to the management and the reply was that under no consideration were the birds to be disturbed. Four eggs were laid and three were hatched amid the straining of the hoist and the frequent voyages along its appointed path. The rights of the squatters were carefully respected and they had many curious and friendly human callers.

THRASHERS SING LUSTILY

Answering the human call, they pour forth a flood of rich song-phrases into the twilight

EVENING SHADOWS on the SANTA RITA

When Twilight Falls on the Arizona Range Reserve

by Walter P. Taylor

Photographs by William L. and Irene Finley

IT IS twilight on the Range Reserve. The sun has dropped behind the distant Baboquivari Mountains, but the sky is still bright. The air is soft and fine, with a gentle breeze blowing through the leafless branches of the mesquites and catclaws. A horned owl hoots to his mate, whose answering voice comes back, deep bass, and hardly feminine. A pair of red-tailed hawks perch on a scraggly nest tree; another two make a last flight over the dry wash in search of something more for supper. Their shrill *peear* thrills with fear various sleek-coated furry creatures which have already begun to venture a short way from their dens. They hustle back to cover. The antelope jack rabbits shed much of their daylight shyness under the protection of advancing night. The Palmer thrashers, fine brown birds with long sickle-shaped bills, sing lustily just before darkness drops its mantle. One of them, noticing a human interloper on the Reserve, whistles a startled "pretty quick!" to which the observer replies with an answering whistle in kind. This reply in its own language so pleases the thrasher that it sings its best, pouring out a flood of rich song-phrases which resound throughout the sandy bed of the dry wash and afar over the neighboring mesa.

A HORNED OWL HOOTS TO HIS MATE

She answers in a voice of such deep bass that one doubts it is a lady calling

Soon the last shred of daylight vanishes. The brilliant light of the full moon shines through the dry, clear atmosphere of the desert, making the Reserve as bright as day. But moonlight is very different from daylight, as every small resident knows, and the thousands of bright-eyed members of the night shift do not hesitate, now, to come forth from their dens. The little Merriam kangaroo rat, and his big banner-tailed cousin; the deer mice, the pocket mice, the scorpion mice, and the wood rats; the kit fox, the raccoon, the badger, various slow-moving and highly dignified species of skunks, and an occasional coyote venture forth. The mere human gets only the barest hints and tantalizing glimpses of the living world which moves so slowly about him. He is more observed than observing!

As he walks slowly along he finds a bush under which is the den of one of the smaller kangaroo rats. Interesting holes into the underground can be plainly

seen, and the well-marked, well-worn trails, radiating from the burrow entrances, stand out even in the moonlight. Suddenly the observer is startled to find that he has been visiting a home where the proprietor is out, for here comes the little kangaroo rat, pell mell, running for its burrow. It is following one of the trails, coming directly toward the visitor. Blocked by way of one trail, the kangaroo rat tries another route, and a third and fourth, finally gaining the den in safety. The little animal relies so much on its trails and den as its only real refuge that its instincts do not seem to work in other channels. It seems never to occur to the kangaroo rat to flee in the opposite direction, or to leave its trail.

ONE OF THE FRATERNITY OF THE NIGHT
When evening spreads its soft mantle he ventures forth to woo romance and adventure

Not far away is the huge, occupied home of a banner-tailed kangaroo rat, biggest and handsomest of all his tribe. The visitor takes his station near the mound, in the hope that the banner-tail will appear. After a wait of nearly half an hour, the proprietor does show up at one of his big doors. Mistrusting the unusual dark object, however, the kangaroo rat beats a hasty retreat, and the den resounds with the vibration of his drumming of alarm or defiance. It continues for some moments, finally fading off into a soft purring sound, and, at last, to complete silence.

Even the horned owl is quiet now. To the casual stroller there is no movement save the land breeze which flows gently down over the mesa. Yet, probably every square yard of the fifty square miles of the Range Reserve, is under the watch of some member of the fraternity of the "white tooth and shining claw". Would that one could know the thousands of little comedies, and tragedies, of life and adventure among them this night.

The LURE of the LIGHT

Electrical Engineer Turns Entomologist

Photographs by General Electric Co.

DOWN through the ages man has known of the attraction of moths to a flare, but not until today has this attraction been used for ridding farms of certain pests. S. P. Storrs, of Storrsland, Ala., plants his crops to supply local markets with vegetables at times when they can not be produced under ordinary field conditions. From one acre he sold, in 1926, approximately nineteen tons of tomatoes. He estimated, however, that at least thirty per cent of the tomatoes produced were made unfit for market by the tomato fruit worm, the adult stage of which is a moth.

Keenly aware of the loss to his crops, Mr. Storrs enlisted the services of the Alabama Power Company. In the Spring of 1927 he and the power company installed a lighting system as an experiment to determine whether or not lights can be used successfully to trap the insect. This lighting system for a two-acre tomato patch consists of eight lights distributed over the area, suspended about four and one-half feet from the ground. Immediately below is a small, flat pan filled with water and kerosene.

A TRAP FOR THE INSECTS
(Below) A wire screen making possible classification of the captives

Insects, attracted to the light, are killed upon splashing in the kerosene. Each moth killed in this manner means a decrease in the eggs laid.

Professor Robinson of the entomology department at Auburn, Ala., is cooperating with Mr. Storrs and the power company in conducting the experiment. Early in the test only seventeen tomatoes with worms had been found, and at that time nearby farmers without a lighting system were losing from thirty to fifty per cent of their crops through damage by the worms.

Being advised by Professor Robinson that the pickle beetle, a serious enemy to the cantaloupe, also flies at night, the lighting system was extended partially to cover Mr. Storrs's cantaloupe patch of one and one-half acres. This insect has also been found in the pans.

The Summer Camp Museum

A Nature Headquarters is a Valuable Camp Activity

by William G. Vinal

Director of Nature Guiding for the American Nature Association

H. W. BLANDING

"CAP'N BILL" VINAL

Our jovial camp visitor at one of the camps. Note the dog's attentive ear

DIRECTORS of summer camps are awakening to the importance of the camp museum as an aid to encouraging Nature interest, and hence to the building up of resourcefulness and ingenuity in the individual campers. There are still many directors who believe that, with the great outdoors on every hand, a museum is superfluous; but the gradual increase in the number of camp museums is testimony in itself as to its real place as part of the regular camp equipment. Not only does a museum contain collections of mushrooms and the like; but it is also a workshop wherein many a rainy day in camp may be put to use. Of course, a museum is not in itself a vital factor, because LEADERSHIP is the key to real constructive Nature study work.

Camp museums should be placed along a well-beaten track so that the campers may drop in at odd moments on the way to or from the recreation hall, the sleeping quarters, or the bathing beach. Few young people will, of themselves, seek out a museum in an out-of-the way corner, but many seemingly different campers will drop in with "buddies" to look around and become so interested in the work that they will soon be as enthusiastic as their more Nature-inclined friends. At Camp Hanoum the museum contains the post office, while the Sargent Camp has a museum in an old boat house near the bathing beach. So successful is this latter arrangement that many of the parents pay more attention to the collections and specimens than to the swimming meets.

A rustic shelter is ideal for a museum, as is also a log cabin such as Wigwam possesses. In these cabins a fireplace is really essential, giving—as it does—warmth and coziness to those retreating to the museum on a rainy day. The triangle fireplace, which was inaugurated at the Luther Gulick Camps, is much the best type. It is not only practical, but it gives an opportunity to see the entire length of the flames, the sparks, and the smoke.

A workshop is never complete without many tables and benches arranged in convenient, well-lighted places. One of these benches or tables should be dedicated to a fresh flower collection. Many camps have small bottles, neatly labelled, to contain each flower, while small wooden steps elevate those in back so that they can be easily seen. In gathering the wild flowers, care should be taken not to gather rare varieties. If time is taken to add to the label of the flower some interesting fact about it, that flower will stand out in the future as a personality instead of a name alone. Home-made apparatus is best.

A MUSEUM CORNER

A glimpse of the workshop at Anawan

Nature photographs add attractiveness to the room. They also stimulate a desire to hunt wild life with a camera as a finer form of sport than with a gun. Work or reference books have a distinct place here instead of in the main camp library. Flower charts are very useful.

Art *in the* Summer Camp

Nature Itself Should Inspire this Work in Camp

These articles are two more in the series based on the survey of fifty summer camps conducted by Dr. and Mrs. Vinal under the auspices of Nature Magazine.

THE TREASURE HOUSE AT KEHONKA
The campers will tell you that it justifies its name and shows the value of a camp museum

The deliberateness with which most art leaders transfer their school program to camp invites criticism. Watch them as they move out of the city in June, laden with batik, books of design, Ivory soap, forms de luxe for electric fixtures, ready made frames with holes in correct position and dowels assured, knock-down bird houses easily assembled, wood baskets with wooden bottoms and frames of exact length —guaranteed to fit together in five minutes, walnut and mahogany veneer tray bases in round, oval, and rectangular shapes with an assortment of butterflies from India; multi-colored fibre which resembles genuine rush for weaving hanging baskets, and a hand lacquer spray pump to put on a stain—furnished in powder form but easily dissolved; and so on ad infinitum to the extent of a trunk full. Yet it would seem that the last thing that a craft counselor should do is to march literally past a thicket of basket willow and send an order to a supply house for raffia.

Nature invisibility is not an infliction of all craft leaders. Not that the camp leaders need be riveted to the open for materials, but that they at least have a consciousness of the fact that the colonists and Indians got their raw material and design from their environment. They should realize that the great masters have had their gifts from Nature and not utterly detach themselves from creative and expressive art. Some art counselors do have a camp mind; they can perceive art messages from the out-of-doors and share them with others.

Kehonka stands above most camps as the place where Nature is used as a distinct and satisfying source of craft interest. Hand-made looms; twig brooms for the hearth; birch furniture; chairs rescued from dusty attics of the village to be canned with cattail; stones in the chimney, and flower borders that resemble animals; metal oak leaves supporting acorn ink wells made true to Nature; bent growths for door handles, and latches lifted by a latch string; crocks with ferns by a rustic pulpit; white birch-log flower-holders for the table are some of the things that embody the spirit of the open.

Tanager Lodge in its primitive arts has "returned to Nature". The children are taught whittling. They make boats, baskets out of ash splints, birch bark boxes ornamented with porcupine quills, fire sets, sketches in the open, and plaster casts of animal tracks. They have made La Crosse sticks and have adapted this fine old Indian game to the age of the campers. There seems to be a real harmony about the Tanager Lodge Tepee, for Fay Welch is carrying on a practical experiment.

AN EFFICIENT FIREPLACE
This triangular plan at Luther Gulick camp

Most camp directors would probably be glad to have campy art work if they could get the leaders. Some day, probably, there will be a text book on the idea. It will tell just how the Indians made their pottery. There will be hints as to how their picturesque language originated. It will go into detail explanation of the making of such common things as soap, corn husk mats, hooked rugs, samplers, spruce gum, horehound candy, quill pens, tanned skins, and the like. And all of these things are not the end in view. The important thing is to get the philosophy of cultivating a love of the simple life and the outdoors.

Another story based on the Smithsonian Chrysler Expedition to Africa

HE WAS UNUSUAL IN EVERY WAY, THIS FELLOW

The Tall Twiga

A Giraffe with a Passion for Telegraph Wires

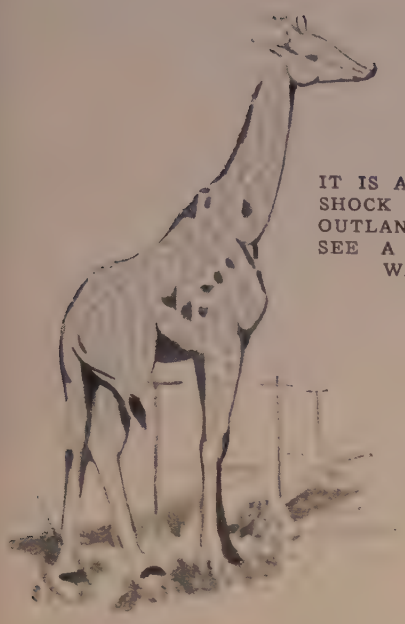
by Stephen Haweis

Illustrated by the Author

TWIGA is Swahili for giraffe, and Swahili is the language of East Africa. A giraffe is an African animal, horned and hoofed, and in no way fitted by Nature to be among the presents placed on baby's bed of a Christmas morning. So long have we been accustomed to nursery representations of it that it is almost a shock to see a live one walk,—even in a circus parade. One feels that it ought to roll on small wheels like its grotesque counterfeits. But, however grotesque the toy, the living model exceeds it in every particular. Close up or far away we are inspired to echo the farmer, "It ain't true; there ain't no such animile." We are convinced that it must be the most ungainly creature on earth, but when it moves we find it to be one of the most graceful, with a dancing gait which makes us laugh with, and not at it.

It is a highly-charged, emotional moment for a lover of animals when first he sees the giraffe free upon his native plains. Strange to say, there are still plenty of them where there are any at all, and they are rigorously protected. Different varieties are found in different parts of Africa. There are three species and two subspecies, but none occur south of the Orange River. The Makati Plains in Tanganyika, those immense flat lands studded with clumps of thorn trees, mimosa, and an occasional giant euphobia, looking like something indefinable out of a Noah's Ark, are the home of a great number of animals, especially kongoni, wildebeest, eland and other of the buck tribes, and among these the giraffe is a welcome neighbor doing,—as he must whether he will or no,—eternal periscope duty. They are the hardest of all animals for a hunter to stalk in consequence.

Sometimes the first glimpse is of one or a pair with a mtoto enjoying hours of conjugal felicity far from the maddening herd. Then, it may be, that the baby cultivates the desire to have as long a neck as Father when it sees its parents contentedly browsing off the young leaves at the extreme top of the trees. For the trees which the giraffe prefers are none of them large, seldom more than about twenty feet high,—which is the giraffe's limit. They have a great objection to the large forest trees: not only can they not eat the top, but they make them jealous. One would suppose that they must be very conspicuous, but they are not. They vary in color



IT IS ALMOST A SHOCK TO THE OUTLANDER TO SEE A GIRAFFE WALK

from very dark to very light and occasional cases of albinism are reported, in which case at a short distance they must look very much like the dead white trees which are so characteristic of tropical bush. It is easy to say that Nature's wise provision clothes them with the color of sand and dried grass. It is true they are then most difficult to see, but Nature has never made an animal with the rich, lush, green color of young grass, and all the plain dwellers are seen just as often against that background as any other.

Strange as the giraffe appears to eyes accustomed to domestic cattle, its peculiarities do not prevent it from being able to take care of itself. It can run with the speed of a good horse in spite of the fact that it moves the fore and hind legs of one side simultaneously,—which is just another of its wanton perversities! It can kick in three directions and may do damage with its head, if not horns, also, for its head must weigh all of twenty-five pounds, and a twenty-five pound lump at the end of a ten foot neck is a terrible weapon. Another peculiarity is that baby giraffes are born with horns.

It is said that a single bull giraffe is a match for a lion, but probably it seldom gets a chance to prove it; the lion is wise enough to hunt in pairs or small groups against which it is helpless. It is the lion's easiest prey when it can be surrounded. Like most people with a universal reputation for nobility of soul, the lion is grossly overrated; he does not aspire to fight fair. He is as mean as an alley cat when it comes to self-interest, and though the female will usually attempt to avenge the slaughter of her mate, the king of beasts, in person, will almost invariably allow her to face the music alone when the firing has begun. One lion draws the giraffe forward while the other springs upon its outstretched neck from behind and the first blow of the paw or shake of the lion's head when the jaws have closed upon it brings down the giraffe with a broken neck.

Even the greatest hog for trophies would not regard shooting a giraffe as sport, but they would be quickly exterminated if general shooting were permitted. The hide is used for making reins for horseflesh and shields and sandals for natives. It is also the best leather for making the long whip lashes used in South Africa for the ox-teams. From no other animal can be obtained an unbroken strip of leather thirty feet long. The giraffe hide is extraordinarily thick and tough, and when fresh its weight makes it a full load for twelve men. It is always in demand because so few are killed. A dead giraffe therefore must be closely watched if the executioner expects to get anything at all: the tail especially must be safeguarded, because its tuft of hard black hair is used to plait into bracelets and all sorts of gewgaws. It is worth seven dollars on the spot, or enough to pay a native's house tax for a year, three times over.

All the big game which is in any danger of extinction is being carefully preserved in Tanganyika Territory, but occasionally the Government finds it necessary to kill off as pests elephants which do great damage to the natives' planted fields. It is very rare that an inoffensive animal, such as the giraffe, comes under the Boma's ban. But it has happened.

There was one giraffe which caused a great deal of trouble to the telegraph company by tearing down the wires with its horns. Of course the wires are placed sufficiently high to be clear of any ordinary wild stock, but the giraffe in question was not in that category. It was distinctly outside it, for it must have been a giant among its kind. The telegraph poles are over twenty feet high and the wires should have defied the best efforts of any giraffe which did not deliberately jump to reach and destroy them. Perhaps they sagged just enough in the middle to make an accident possible: otherwise we must suppose that it was a matter of pride or malice prepence that the big fellow interrupted communication so often.

Complaints reached the office in Dar-es-Salaam and at last the game department authorized a man to go out and shoot the marauder. For a long time they hunted in vain. The hunter scoured the country with a car and made frequent trips on the railway lines in the little cars which are pushed by hand by natives, who run without complaint upon the fiercely hot strips of steel, or on the bed of stones between them, which is not much better. At last they met their quarry at a grade crossing. Near the pole he could easily reach the wires with his long, black inquisitive tongue. Half way between the poles he could almost run into the wire without straining upwards at all: there was no doubt whatever as to his identity. Never had either of the men seen so large a specimen before. The chauffeur stopped

IT WAS AN EASY SHOT BUT THE HUNTER MISSED SIX TIMES

the car gently and the hunter got out his rifle as quickly as possible. In a moment the great fellow would be represented only by an escort of fine dust; there was no time to lose. Most giraffes do not wait when a snorting car stops within thirty-five feet of them, but this one was unusual in every respect.

"That," said the giraffe, "is not only the strangest, it is also the largest beetle I ever saw in my life. No doubt it is the king of the beetles, and since I am the great Chief of the Giraffes, it is right that we should meet. Without doubt it is going to offer me some sort of salute."

The salute which was being prepared was of one gun. The hunter raised the rifle to his shoulder and drew back the bolt. The animal's quick ears at once shot forward as it stopped licking the telegraph wire, but it did not turn to run; instead it stayed just where it was, beaming with affability from its huge black eyes. The hunter could not pull the trigger, and then in a moment lowered his weapon.

"It's an easy shot," he said, to gain a little time.

"Couldn't miss at that distance with your eyes gummed up."

"Did you ever shoot a giraffe?"

"No sir, I never did."

And the giraffe stood and watched them. It lowered its head and for a moment seemed to be going to come closer. Step by step it did come, until it was scarcely more than twenty feet from the car.

"Would you like the shot?" said the hunter. "You don't often get a chance like this. You shoot it."

"No thanks, it's your shauri. I really don't care about it. Not that giraffe, anyhow."

The hunter sighed and raised his rifle again. He fired six cartridges, but without any of them taking effect.

"We'll be getting home now," he said, as the giraffe sprang along in the general direction of Abyssinia, "we found him at least, and we got a shot at him. I suppose anybody's liable to miss,—that is, once in a while."

With increasing rapidity the National Zoological Park in Washington is approaching the position that it should rightfully hold,—that of being the Nation's leading zoo, by, for, and of the Nation. This was tremendously furthered by the recent expedition to Tanganyika Territory, Africa, which brought back a collection that constituted the largest addition to the Park ever added at one time.

Through the generosity of Mr. Walter P. Chrysler, the automobile manufacturer, who contributed the funds to the Smithsonian Institution for the work, this was made possible. The contribution enabled the party, under Dr. William M. Mann, Director of the National Zoological Park, to spend four months in the field collecting and to take care of the varied expenses that such a trip involves. It was a direct contribution to the people of the country because the popular Zoo in Washington is theirs.

DR. WILLIAM M. MANN

Beside Dr. Mann, the members of the party were Mr. Arthur Loveridge of the Museum of Comparative Zoology at Cambridge, Mr. F. G. Carnochan of New York and Mr. Stephen Haweis, the author of our series of articles. The last two were volunteers.

Headquarters were established at Dodoma with Mr. Loveridge in charge. Mr. Carnochan went to Tabora, Mr. Haweis to Mhonde and Dr. Mann worked around Lake Manyara and into the Tula District. Complete cooperation was enjoyed from His Excellency Sir Donald Cameron, Governor of Tanganyika, in furthering the work of the party, and the four months' collecting was rich in results.

Many animals were secured that are new to the National collection. These included giraffe, white-bearded gnu, impalla, reed buck, and long-eared fox. Other notable additions included a male greater kudu, a female eland, a quartet of wart hogs, five leopards, five hyenas, ratel and civet cats and seventy monkeys. In this last group are five rare and desirable blue monkeys and five purple-faced monkeys. From the Sudan Government was obtained a splendid shoebill stork, the second to arrive in America and the first in Washington.

MR. WALTER P. CHRYSLER

Beside many smaller mammals collected, quantities of birds were obtained, notably a troop of six crowned cranes and two rare species of lovebirds. For the housing of these new avian tenants, as well as the older residents at the Zoo, the new bird house was vitally needed. Few reptiles were brought back because of the lack of housing facilities.

THE readers of Nature Magazine are already well acquainted with the name of Charles Fitzhugh Talman and his writings. A better introduction is in order, however. He confesses to having been born in Detroit some time after General Hull surrendered the place to the British but prior to its capture by Henry Ford. He now lives in Washington, D. C., where he is librarian of the U. S. Weather Bureau. Many years ago he carelessly wrote an article for a magazine and it has become a habit. Mr. Talman is the foremost authority in the world on questions of meteorological terminology and nomenclature; "which", he modestly explains, "is partly due to the fact that there aren't any others. Nobody else has ever bothered with the subject".

CHARLES FITZHUGH TALMAN

SWAMPS, BOGS, MARSHES-OR WHAT YOU WILL

A Story of the Forming of Wet Places and Some of Their Products

by Charles Fitzhugh Talman

WHOEVER undertakes to write about the tracts of permanently wet but not completely submerged land that form so large a part of the earth's surface finds himself, at the outset, embarrassed by the problem of what to call them. They bear a great variety of names, corresponding only in an indefinite and ill-recognized way to actual differences among the things themselves.

In America we hear chiefly of swamps and marshes; between which the late Professor N. S. Shaler endeavored to establish the distinction that the former contain fresh water and the latter salt. In this country we have, also, sloughs, swales and muskegs. Ireland is the land of bogs. The English are more familiar with fens, and the Scots with mosses; yet one of the most celebrated of these damp spots in England is the Chat Moss, in Lancashire, over which George Stephenson constructed the Liverpool and Manchester Railway after other engineers had pronounced the feat impossible. Some of the moors of Great Britain and continental Europe are distinctly boggy, while others are not. Morasses and quagmires are better known to literary folk than to the rest of humanity. The dictionaries recognize the existence of everglades outside of Florida, but in current speech the name is monopolized by a particular district of that state. Lastly, the Arctic tundras are largely swampy when they are not frozen solid, and the alkali flat, in its wet stage, has been defined by physical geographers as a "desert swamp".

FROM A WALL CHART BY PONTONIÉ AND GOTHAN

A FOREST SWAMP OF LONG AGO

Showing several of the typical coal-making plants of the Carboniferous Period

A swamp—to accept the common American term in its broadest sense—is a part of the land surface that is soft, spongy and saturated with moisture, though not usually covered with water. Vegetation, both living and dead, forms a great part of its substance in most cases. The presence of water is due to

A SWAMP-LOVING SOUTHERN TREE

Bald cypresses on the shore of Lake Drummond in the Dismal Swamp

U. S. GEOLOGICAL SURVEY

inadequate drainage. Sometimes it is the contour of the land that favors the retention of the water, and sometimes a dense mass of plant growth checks the run-off. Another factor in maintaining swampy conditions is an underlying stratum of impervious soil. Some swamps derive their water entirely from rainfall; others in part from springs. The overflow of rivers forms swamps in adjacent lowlands, and the tidal flow of the ocean produces them along low coasts.

In innumerable cases swamps represent the last stage in the gradual filling up of lakes by the deposit of sediment and the growth of vegetation. There are several rank-growing plants that flourish in shallow water. Beginning along the shore, these plants grow out toward the deeper parts of a lake, and their débris rapidly builds up the level of the bottom. In the open air the litter of vegetation is quickly oxidized and passes off as a gas; so that, for example, the floor of an ordinary forest is little elevated from year to year by the deposit of leaves and branches. Under water such material is preserved and is gradually converted, by decay and compression, into the substance called "peat".

In the Old World blocks of peat, cut from the bogs and dried in the open air or by artificial heat, have long been used on a large scale as fuel. In Ireland peat forms the chief fuel of the country. It is estimated that the United States and Canada contain 50,000,000 acres of peat beds; but it has not been found economical to exploit these deposits except in a small way for local use. The annual peat production of the United States is from 50,000 to 60,000 tons. We do, however, make ample use in this country of a fuel that was formed under water in the same manner as peat, though mainly from quite different kinds of vegetation and probably along ocean shores rather than in inland swamps. We call this residue of prehistoric plants "coal".

In the northern United States the chief swamp-making plant is the peat moss, or sphagnum, though some northern swamps depend largely on the growth of rushes and grasses. From Virginia southward the cane becomes prominent in swamp vegetation. Other common elements of such vegetation are the bald cypress, juniper, green-briar and species of grape. Along the seacoast from southern South Carolina to the Mississippi delta the dwarf palmetto is a prevalent

A GREAT SWAMP-MAKER OF THE TROPICS

Along low-lying coasts in the tropics the mangrove grows in vast swampy thickets. Note the aerial roots that help it spread

U. S. FOREST SERVICE

swamp-breeding species, and on the coast of southern Florida is seen the mangrove, the characteristic swamp plant of tropical shores.

No plant is more interesting in its habits than sphagnum. During the world war the American public heard a great deal about this moss, which, on account of its extraordinary capacity for absorbing moisture, was used as a substitute for cotton in making surgical dressing; an expedient also practiced to some extent in earlier wars. Florists have long used sphagnum in potting plants and packing them for transportation.

In filling a pond or lake, sphagnum not only takes root in the mud at the bottom but also forms a tangled mat floating on the surface. This may eventually become a complete covering, beneath which is a miry liquid; part water and part decaying vegetation. In this stage we have what is called a "quaking bog". It trembles under the foot and is likely to break under the weight of a person attempting to cross it. Many men and animals have been thus engulfed; and in some cases their bodies have been recovered years afterward, perfectly preserved by the bog water, the acids in which have antiseptic qualities.

In a damp climate it sometimes happens that sphagnum spreads outward as well as inward from the margin of a pond. It thus expands the swampy area and even climbs surrounding hillsides to a height of scores of feet. "Climbing" bogs are commoner in northern Europe than in the United States, where the hot summers tend to check their formation.

In the British Isles many bogs are somewhat above the level of the adjacent country. After heavy rains water sometimes accumulates under a bog to such an extent that it breaks loose and descends in a muddy deluge on neighboring fields and farms. A swamp that thus gets out of bounds is called a "bursting bog". Cottages have been filled to the roof in these sudden flows, and in several cases human lives have been lost.

The cane, growing in our southern swamps, is a giant grass, which sometimes attains a height of 25 feet. "Cane brakes," as the thickets of this grass are called, are so dense that they serve as dams, which sometimes maintain the level of a swamp a foot or more above that of an adjoining stream of open water. Heavy growths of timber are found in both northern and southern swamps. In the former the tamarack, or larch, is

MAPPING A MISSISSIPPI SWAMP

All in the day's work of the United States Geological Survey topographers

U. S. GEOLOGICAL SURVEY

IT IS NO SMALL TASK LOGGING IN A LOUISIANA SWAMP

Showing a "pull boat" towing cypress logs down a specially constructed canal that makes the work a possibility

NATIONAL LUMBER MANUFACTURERS ASSOCIATION

common, while in the swamps of Virginia and the Carolinas the most conspicuous tree is the bald cypress, remarkable for its buttressed trunk and its "knees," growing up from the roots.

The mangrove forms dense jungles in the salt-water swamps of tropical and subtropical seacoasts. This curious tree, besides throwing out numerous roots from the lower parts of the trunk, sends down slender roots from the branches, after the manner of the banyan, and even from the germinating seeds before they fall from the tree. The mangrove fringe along the coast in southern Florida has, as Shaler points out, extended the swamp area of that state over wide districts which, but for this growth, would be occupied by shallow salt waters. In a large measure the district of the Everglades has been converted from a shallow sea into marshes by the growth of this peculiar vegetation. The spread of mangrove thickets would probably be much more rapid than it is, if it were not held in check by fish, especially the mullet, which feed on the tips of the young roots.

U. S. BUR. OF PUBLIC ROADS

AN EX-SWAMP IN INDIANA

The transformation wrought by drainage; cornfields bordering a macadam road

PEAT IN THE MAKING

The water-soaked floor of a forest swamp, where the decaying litter is preserved by the water

U. S. BUREAU OF MINES

Though swamps are commonly regarded as waste land, they actually serve a number of important purposes in the economy of mankind. In this country a large amount of valuable timber, such as juniper, cypress, tupelo and white cedar is cut from them every year, and, where correct forestry methods are practiced, some of these timbered swamps are undoubtedly worth more in their present state than they would be if they were drained and converted to agricultural uses. Peat, as we have already mentioned, is a leading product of swamps in some countries. Two minor products of considerable interest are bog-iron ore and bogwood. The former is found to some extent in nearly all swamps. It results from the action of decaying vegetable matter on iron salts dissolved in the water. The swamps of New England alone have been estimated to contain 500,000,000 tons of this ore. The first blast furnaces erected in this country were supplied with ore from the bogs, but on account of its inferior quality and the difficulty of collecting it very little is used at the present day. Bogwood consists of the trunks and large branches of trees that have long been buried in swamps and have become impregnated with iron. This wood has a shining black or ebony color, and has been used for making furniture and such ornaments as brooches and earrings. The art of carving bogwood has long flourished in Dublin.

The cultivation of cranberries depends upon the existence of swamps. The typical cranberry marsh is prepared by removing the surface layer of vegetation and draining the soil; which, however, must be flooded at certain seasons. Generally a coating of sand is spread over the marsh to keep down weeds. The cuttings of the plant are set out in the bed thus prepared.

The greatest value of most swamps is potential rather than actual. Their soil is extremely rich, and, when drained and properly prepared, makes excellent farming land. In the United States we have about 79,000,000 acres of wet lands, of which more than 52,000,000 acres are permanent swamp. In the aggregate a very large area of such land has been reclaimed through the activities of "drainage districts," organized under state laws, and various other agencies.

On the aesthetic side, swamps have aspects that appeal strongly to the imagination, and their history is fraught with romance. It was in the Isle of Ely, protected by the surrounding fens, that Hereward the Wake maintained the last stronghold of the Saxons against the Norman invaders; and in modern times the Seminole Indians, in the fastnesses of the Florida Everglades, waged long and bloody war against the authority of the United States.

The incomparable poet of the marshes is Sidney Lanier. The Marshes of Glynn (near Brunswick, Georgia) ought surely to be a Mecca of pilgrimage for all who know the supremely beautiful lyrics they inspired. What an experience to stand where the poet stood at daybreak!—when

> The tide's at full; the marsh, with flooded streams,
> Glimmers, a limpid labyrinth of dreams—
> Each winding creek in grave entrancement lies,
> A rhapsody of morning stars . . .

A STRIKING RECORD
Western azalea filmed against the noble background of El Capitan

A. C. PILLSBURY

CAPTURING the OUTDOORS

The Thrill of Nature Filming with an Amateur Movie Camera

by Walter D. Kerst

NO MEDIUM like the motion picture can so well bring all of the outdoors to one's own hearthstone. The creatures of the wilderness, the flowers and shrubs of mountain and meadow, as well as the infinitesimal bits of life that are hidden from all save the eye of the microscope, can be shown to thousands who would otherwise never know of their existence. Where, heretofore, the joyous thrill of living with Nature has been limited to a comparative few, these same pleasures are now available to countless numbers through the medium of the motion picture, enjoyable to a degree that may not equal but certainly approaches living in close contact with the great outdoors.

It was about three years ago that the amateur movie camera was made available to the layman. For a quarter of a century he had been seeing on the theatre screen the elimination of time and distance, the flash of the wonders of the universe before him. True it has been, and still is, that films of Nature have all too seldom been his to view. Nevertheless, those few shown are but samples of what he, himself, now can produce for his everlasting pleasure and enlightenment. The Nature lover who, today, is tramping through wood and dale without the companionship of one of these miniature cameras is missing a great deal of the fun of his hobby, to say nothing of the untold secrets of the wild that his lens will reveal to him, and the records it will provide him.

In the three years that have elapsed since the introduction of these machines, much progress has been made. These years have witnessed the formation of an amateur league of movie makers, the Amateur Cinema League, an international organization now numbering thousands of members. There has also been brought forth in this short space of time a wide range of cameras and accessories, so

MR. KERST, *the author of this article, is the Technical Editor of* Amateur Movie Makers, *the official publication of the Amateur Cinema League. The League, through its technical and amateur photoplay club services, is aiding the enjoyment of amateur movie making.*

This article is one in the series of practical photography articles that will be a regular feature of NATURE MAGAZINE. *Also you will find the helpful photographic service department in this and every issue.*

ROBERT C. BRUCE

A STUDY IN CONTRASTS

Photographic records on the films of one's pets and their antics are invaluable and one day will evoke fond memories

perfect in workmanship and design that the beginner can make successful films from the very start. In addition to one's own photographing, the professional, or standard 35 millimeter width films, as they are known, are being made available by reduction printing for home showing on the narrow gauge, 16 millimeter amateur film. These films can be rented or purchased outright and there is a wide range of subjects from which to choose. For example, the Tolhurst microscopic pictures and the flower studies of A. C. Pillsbury can now be viewed in one's own living room. The exquisite flora of the beautiful Yosemite are shown in all their lovely settings, and those scenes, where one sees the opening and closing, the life and the death of flowers, in the twinkling of an eye, are nothing short of magic.

The cameras that use the narrow width 16 millimeter film, or as it often has been designated, amateur sub-standard film, range in price approximately from $70.00 to $250.00. It might be said here that the lowest price camera, used under the particular light conditions for which it is intended, will give as good a picture as the higher priced ones, but the cheaper cameras are limited as to their flexibility, that is their ability to take pictures under any and all conditions the cinematographer might meet. In Nature work, one should use a camera on which lenses can be interchanged, because the filming of wild animals calls for long focus lenses that will magnify their size on the film, and closeups of flowers in deep woods call for fast lenses of short focal length.

In the Nature lover's cinematic kit there should be a camera, equipped with a standard lens, a telephoto, or long focus lens, and a fast lens,—that is, a lens with a wide opening which will pass an unusual amount of light to the film. Whenever possible, a strong, lightweight tripod should be used. Although these amateur cameras were designed to be held in the hand, such a procedure should be reserved for an emergency only, where it is impossible to set up a tripod. Pictures made with the camera on a firm support are notable for their steadiness on the screen and the sharpness of the image. Of course, all the lenses suggested are not an absolute requirement, but the writer strongly advises their purchase. With them there is little that cannot be filmed, under all conditions imaginable. Further inexpensive accessories are color filters for registering beautiful cloud forms, iris vignetters, for fading one scene into another, and a good exposure meter for judging the actinic, or photographic power of the light.

For showing the results of one's labors, a screen and a projection machine will be needed. These range in price from $80.00 to $210.00. The lowest price complete equipment,—camera, projector and screen,—on the market at the present time costs approximately $140.00. There are indications, however, that this price will be lowered in the near future, thus making the fun of tak-

ROBERT C. BRUCE

BRUIN IS A POPULAR FILM ACTOR

A bear hunt with a camera has many thrills that a gun does not afford

A. C. PILLSBURY

A WESTERN BLUE IRIS

The Pillsbury films show the flowers in the process of growing from bud to bloom

ing personal movies available to a much larger group than at present.

In the domain of the sportsman, the amateur movie camera is gaining great headway, and in the years to come one will probably see an increasing army of enthusiastic hunters stalking their quarry, camera in hand, hunting for a trophy that will bring far greater pleasure than killing for the sake of the kill.

There are few other forms of amateur movie making that surpass the thrill of shooting game with a ciné camera. Picture in your mind's eye, a huge Rocky Mountain sheep—a ram—silhouetted on a cliff, a few hundred yards away, staring down at you with his natural curiosity! You feverishly calculate what lens opening to use, how far away he is, and how much footage to give him. Then (because you did not have a long focus lens with you) you start and edge your way towards him, crawling on the ground, hiding behind rock, tree stump—anything that will keep him there while you approach for that much hoped for closeup. It is slow work, but nearer and nearer, inch by inch you go, until you are only a few yards away. Then you click the starting button on your camera—and off he goes, snorting with disgust at your fool antics. But were those antics so stupid? You'll say not when you see those pictures in the comfort of your den, and actually relive that exciting moment.

ROBERT C. BRUCE

AS VACATION MEMORIES

Many of the thousands who visit our National Parks in summer carry movie cameras and take home moving reminders of such scenes as this

ROBERT C. BRUCE

A DEER IS AN APPEALING SUBJECT

In the wild it is a difficult one to stalk for photographing with the ciné

FILM PICTURE OF A SNOW PLANT

This is one of the subjects taken by Mr. Pillsbury in his famous flower series

A. C. PILLSBURY

Probably few hunters will be so fortunate as to come upon a band of Rocky Mountain sheep in their natural habitat, but there is no less sport in the shooting of other game. Wild bird photography is an absorbing avocation, and it requires much skill, sound cinematographic knowledge, and unlimited patience. Arthur L. Clark, amateur cinema specialist, well expresses the possibilities of Nature work when he says:

"Nature work is not as difficult as is generally supposed. It will become more popular when it is realized that elaborate equipment and much experience aren't essential for the taking of good pictures. As a matter of fact, amateur cameras are better suited to this work than are the cumbersome professional ones. Special lenses can be used to advantage, extending the range, getting closeups and adding some intangible quality to the pictures, but with the regular equipment of one inch universal focus lens very good results can be obtained. In a review of 400 feet of specially selected shots of ruffed grouse, one of the most interesting was taken with the one inch lens.

"Nature photography for the amateur may also provide a lot of pleasure without going into it too deeply. There are plenty of interesting subjects almost in our own back yard; we do not have to go long distances or seek out rare animals to get wild life movies which will prove intensely interesting to us and to those whom we

may show our pictures. In fact the more common birds and animals have a greater popularity than the rare or strange ones, probably because we recognize them as old friends. The robin's nest in the vine on the porch may provide a subject with just as much pictorial possibility and human interest as the bird nesting on the cliffs of Labrador. The rare wolverine or the fisher of the north country offer no more interesting opportunities for attractive composition and life history studies than the chipmunk that lives in the very small burrow under your farmer friend's stone wall, or the woodchuck with his home in the open fields. Here is plenty of comedy, too, especially if you get pictures of the young.

"The problem of finding location is made easy by getting acquainted with sportsmen, farmers, woodcutters or others who spend much time out of doors. They know where there are nests and dens; where the deer are feeding; where the gamey places are, and the runways. To get the subject before the camera and acting naturally may also be made easy.

"If you can find a nest with eggs or a den with young the parents will surely come to it if you are quiet and wait long enough; it is often surprising how short a time it is necessary to wait, sometimes only thirty minutes or less, usually less than an hour.

"There are opportunities for Nature photography on all sides, some easy, others more difficult. There is a fascination about it all, opening new fields to the amateur which any may find if time is taken for it.

"To watch a wild bird or animal, unaware of your presence, at close range is an experience that you will long remember. To photograph it in motion is an experience that you can never forget. The film and your friends won't let you."

WALTER D. KERST

A SHOT OF A "FOOL HEN"

This is what the Franklin grouse is called by natives of Mt. Robson Park, B. C., Canada

The amateur movie camera is not confined to the hunter's realm only. In the angler's paradise, many movie cameras can be pointed streamward; where the salmon leaps as he tries to free himself of the hook. What opportunity the disciple of Izaak Walton has for recording dramatic action; action that is drama because it is *real,* not staged! Imagine the beauty of line, the play of the warm sunlight on the flashing spray as the victim leaps high in the air, dropping back in the stream, again and again, to renew his apparently untiring efforts.

And last, but not least, is the possibility of filming microscopic life. There have been recent accessories made for the amateur camera that make possible microscopic filming with an accuracy and clearness that is amazing. Imagine the fascinating thrill of seeing on the screen, enlarged many thousand times, the tiny cells of life that are visible only through the lens of the microscope. But, best of all, is the realization that the actual filming of such a subject is possible for you, who are reading this article. It is not as difficult as it seems when you see others' films.

Indeed, the world of the cinema has changed greatly since the introduction of the amateur ciné machine. It is certain that your trip to the great outdoors, whether it be in search of bird, beast, or flower, will be enriched to untold degree, if you bring back most of your trophies on motion picture film.

ROBERT C. BRUCE

EXCELLENT COMEDY MATERIAL

Such films as these can easily be made by the amateur and are a source of endless amusement

TRULY A PACKFUL
In fact it looks like a serious case of mumps

OUT-PACKING the PACK RAT

by F. W. Schmoe

Park Naturalist, Mount Rainier National Park

EVERY DAY is moving day, or so it seems to the visitor to Mount Rainier National Park, but when it comes to organized, wholesale, moving activities Mrs. Callospermophilus is a specialist in the field. She has the equipment for the work, with fur-lined side-packs that are built-in features!

The mantled ground squirrels, as this family is better known locally, are about the size of the local Douglas squirrel but their tails are not so bushy and their legs are shorter. Ground squirrels seldom climb trees and do little jumping and so they do not need long legs and bushy tails.

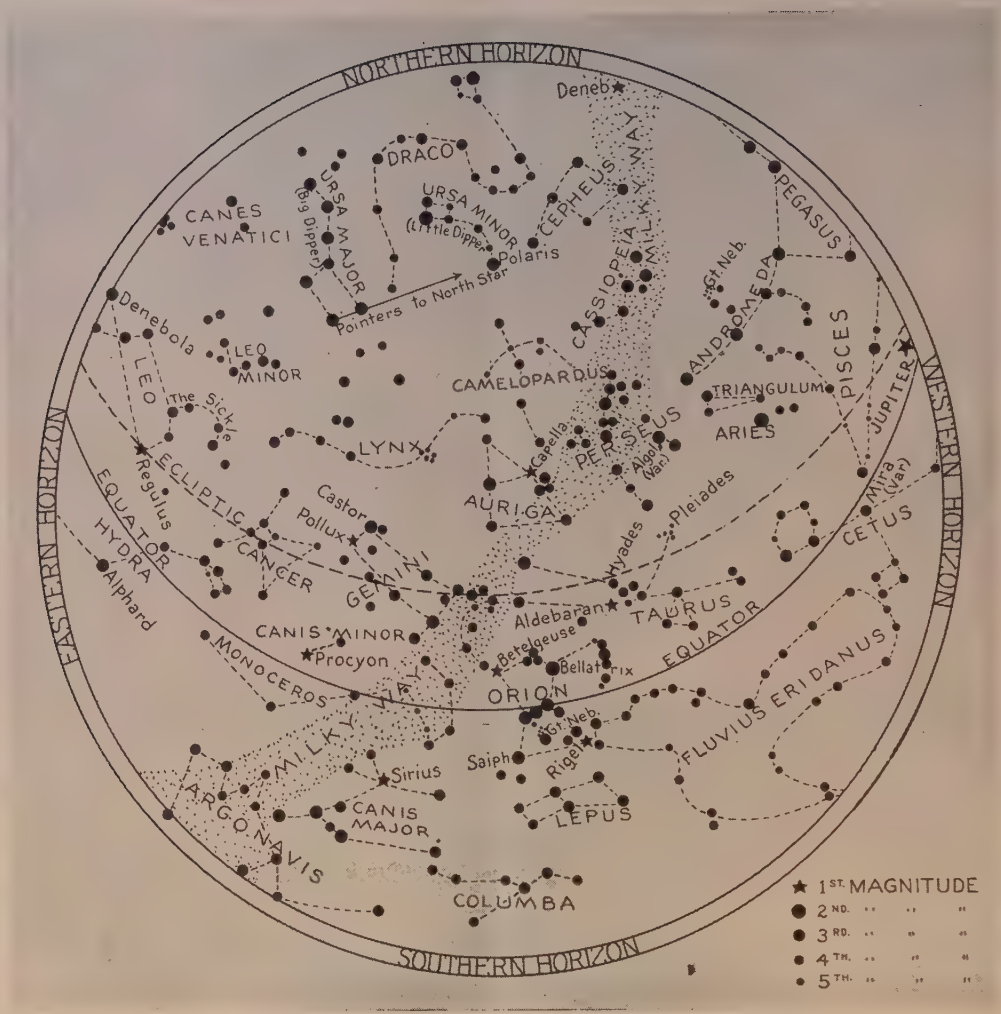
On several occasions we watched mother ground squirrels carry their half-grown young from one den to another,—carry them in spite of the fact that they were too heavy to carry and amply able to travel on their own legs. The method of holding the young while in transit is different from that employed by most small animals, including their cousins the chipmunks. Mother ground squirrel rolls the little one over with her nose, takes hold of the loose skin of his belly with her mouth and picks him up bodily. Then baby ground squirrel wraps his tail and hind-legs snugly about mother's neck on one side, and his head and fore-legs about the other, then away she goes with a living squirrel-skin "choker" about her neck.

TOO HIGH!
It is almost too much to expect of a squirrel

The cause of hasty migrations is not dissatisfaction with present quarters or failure to pay the rent. Nine times out of ten it is a weasel. But the thing we started out to tell about is the remarkable capacity of those fur-lined side-packs which are the moving vans of Mrs. Ground Squirrel & Company.

A member of the company lives alongside our camp. During the Spring she became so fearless that she did not hesitate to eat from our hand. Recently we tested the capacity of her cheek pouches. We provided the materials, she the demonstration. Mrs. Ground Squirrel placed slightly less than two ounces of salted peanuts—rather bulky material—in her side-pouches at one time. The load totalled about one hundred nuts.

Several times during the loading process she would drop flat on the ground and pushing herself with her feet slide her bulging neck along the ground for a short distance, then resume the storing of cargo. Apparently this was her means of pushing back and settling the load. When not another peanut could be stored inside she took one in her teeth and scampered away to her den, looking very much like a serious case of the mumps.



TO USE HOLD OVER THE HEAD WITH TOP TOWARD NORTH

This map is for February 1, 9 p. m.; February 15, 8 p. m.; February 28, 7 p. m.

SIRIUS *and its* STRANGE COMPANION

by Isabel M. Lewis

ONE might think it quite sufficient honor for a star to be known as the brightest and finest by far of all the stars in the heavens, as is the case with Sirius, The Dog-Star, now so conspicuously in view in the southern sky in the early evening. Yet, in addition to this, Sirius also has the distinction of possessing one of the most remarkable stars for a companion and attendant. Probably no star in the heavens has received more attention from astronomers or has been more talked about than this strange companion of Sirius.

The great Bessel, a famous astronomer and mathematician, over eighty years ago noticed that Sirius behaved in a most erratic manner that could only be explained by assuming that it was swayed by some unseen force. He rightly concluded that the cause of its shifting position was a companion star that was massive enough to swing the brilliant Sirius around in an orbit described about their common center of gravity although it was too faint a star to be seen in the glare of light from Sirius.

Then came the time when the companion of Sirius was actually seen for the first time. Alvan G. Clark of the famous optical firm that has made lenses for great telescopes for many years, was testing out a new lens in the year 1862 for the 18-inch telescope for the Dearborn Observatory, which at that time was the largest lens in the world. The better a lens the more sharply defined and point-like the stars appear when viewed through it. Sirius because of its extraordinary brilliancy is a severe test for any lens and so the new lens was tested on Sirius. Imagine the surprise and delight of the observer to find a tiny point of light gleaming faintly through the glare of light surrounding the brilliant star! The companion of Sirius had been found visually at last. Today it may be seen in any of the great modern telescopes, though of course it still remains unseen in small or moderate-sized telescopes because of its extreme faint-

ness and the brilliancy of its illustrious neighbor.

After the excitement of its discovery had abated, years passed by without much attention being paid to this small stellar body basking in the rays of the finest star in the heavens. It was known that the distance between the two stars was about 1,800,000,000 miles which is nearly the same as the distance of the planet Uranus from the sun. The two formed one of those double-star systems so frequently found among the stars. They were revolving around their common center of gravity, it was also found, in a little less than fifty years. So faint was the companion star that it would take 360 stars equal to it in brightness to give forth as much light as the sun, and yet for all of its faintness it was a very massive body, four-fifths as heavy as our own sun. It was assumed that it must be a very large star that was "dying out" and therefore faint.

Our monthly astronomy article has been a popular feature of Nature Magazine for more than three years. It started with merely a consideration of the monthly skies. For more than a year a discussion of a constellation was combined with the consideration of the evening skies. We recently conferred with Mrs. Lewis and from now on she will discuss some interesting point in astronomy, including, however, a star map each month and hints on what to see in the night skies.

Then came the next surprise in the surprising history of this strange star. Dr. W. S. Adams of the Mt. Wilson Observatory while studying the spectrum of this star in 1914, a very difficult matter since the star is so faint, found that it was a tremendously *hot* star. It belonged to the class of white stars which are known to be the hottest of all the stars. Here then was a star extremely faint but at the same time "white-hot". Its faintness could be explained only by the fact that it was an extremely small body. Calculations showed that this white dwarf star, as it is called, is only about 20,000 miles in diameter, three times, approximately, greater in diameter than our own little planet, Earth; but it contains four-fifths the quantity of matter in it that exists in our own sun with its diameter of 864,000, and is at the same time white-hot, far hotter in fact than our own sun. Was ever such a strange body heard of? There was only one way in which such an enormous quantity of matter could exist in such a tiny planet-like body. Its substance must be squeezed together and packed down until its density equalled 60,000 the density of water, or 2,000 the density of platinum, until, in other words, a cubic inch of its substance weighed a ton! It was absurd and unheard of at first thought. We had, in our laboratories, no experience with matter in such a state. But it is difficult to reproduce on earth the conditions that exist in the interior of a star, which is a sort of a chemical laboratory in itself where wonderful changes are taking place among the atoms. But, finally, just as man has found a way to weigh the stars and find their distances and diameters he also has found a way to dip beneath their surfaces and find out what is going on there. The reason for the existence of matter in such a state in the interior of some stars has been found.

The recent remarkable work done by Prof. Eddington, the noted English astronomer, on the interior constitution of the stars has solved the mystery of the strange companion of Sirius and given us a vivid picture of what is taking place inside the stars and inside of our own sun, which is but one of the stars. At the tremendous temperature of millions of degrees that exist far beneath the surfaces of the stars atoms of matter may be partly stripped of their electrons which are lost as a result of the collisions between atoms, which become far more frequent when the star's interior is tremendously hot and the frequency of their vibrations are greatly increased. The loss of electrons from the atoms greatly increases the density of the star for far more atoms can be squeezed and packed down into a small space than when they are in full possession of their normal share of electrons. The hotter the star the more likely it is to lose electrons through collisions of atoms and so become denser, or heavier, and smaller. This, then is the explanation of the existence of the tremendously hot, white, "dwarf" stars of which the strange companion of Sirius is the most noted example. It is a tiny little sun not much exceeding our own earth in size but hotter than the sun by far and made of stuff so heavy that a small sample the size of a golf ball would weigh over a ton.

So some clear, February night as you admire the sparkling, diamond-like splendor of the Dog-Star, our near stellar neighbor less than nine light years away, give a thought to that strange little body tucked away in the rays of its illustrious companion which eluded astronomers for many years and then puzzled and perplexed them for many more before they solved its mystery.

Among the other stars and constellations this month do not fail to admire the magnificent Orion now so conspicuously in view in the south, or Gemini, The Twins, now approaching the meridian high in the eastern sky. In the southern part of the United States, Canopus, the second brightest star, a beautiful white star, will be seen above the southern horizon this month for a short time. The Pleiades and Hyades in Taurus are now high in the southwest and Capella one of the finest stars in our northern skies is now directly overhead in the constellation of Auriga, The Charioteer. Look also for Regulus at the end of the handle of The Sickle in Leo this month, far over in the east, and the Big Dipper now coming into a better position for observation in the northeast.

Jupiter is still the only bright planet in the evening sky except for Mercury's brief appearance for a few days around February 8 low in the west for about an hour after sunset. It is doubtful if it will be seen this month as it is not in a favorable position for observation. Jupiter is now in Pisces well over in the western sky in the early evening. Mars, Venus and Saturn are all visible in the eastern sky before sunrise. Saturn is in Scorpio west of Mars and Venus, which are in conjunction in Sagittarius on February 18. Venus will then be about two degrees south of Mars. Venus passes from Sagittarius into Capricornus this month as does Mars also, the two planets remaining near each other throughout the month.

HINTS AND HELPS FOR *HOME and GARDEN*

FEBRUARY

by
Thomas Sheward

IN THE northern states very little can be done outside in the garden this month except pruning. In the south, and on the Pacific Slope all pruning should be finished this month, with few exceptions. Hardy clematis such as *C. Jackmanii* and *C. Anderson Henryii* will be cut back as illustrated, to a few strong shoots, for best results.

* * *

Lawns should receive a dressing of wood ashes, soot and fine soil, or fine bone dust this month, this being well raked in and afterwards rolled. Bare patches should now be seeded down.

* * *

This is a good month for planting trees, shrubs, and berries, while grape vines are better planted next month.

* * *

Geraniums and fuchsias that have been stored away in the cellar all winter should now be cut back, and started in a warm room. Cuttings can be taken as soon as new growth starts.

* * *

Dahlia tubers are divided to single pieces as illustrated and any good sorts can be started in the hotbed and propagated by green cuttings. Gloxinia and begonia bulbs are also started this month. Hotbeds are made up about the middle of the month for early flowers and vegetables.

May we call the attention of our new members to the following helpful Garden and Home Bulletins that will be mailed for a two-cent stamp:

No. 31—Planting Your Bulbs
No. 32—Gardens Under Glass
No. 33—With the Aid of Lattice.

The first week in March is quite early enough for such things as asters, stocks, zinnias, and other half-hardy annuals. Old window sashes make good garden frames, and where there are any of these not in use, it is a good plan to use them for growing plants. The diagram shows how a hotbed is made. The manure should be fresh and warm, and packed into a bed about two feet deep, with the frame on top. About six inches of good soil is used for growing the plants, and it is a good plan to scald this with hot water before sowing the seed. This destroys weed seed. Many perennials can be sown now under glass, and will flower during the summer.

* * *

Snapdragons should be sown now in the hotbed to produce strong plants for flowering all summer. The pink shades are fine for cutting, and mass planting. Good named pink sorts are—Nelrose, Pink Domino, Enchantress, and Pink Gem.

* * *

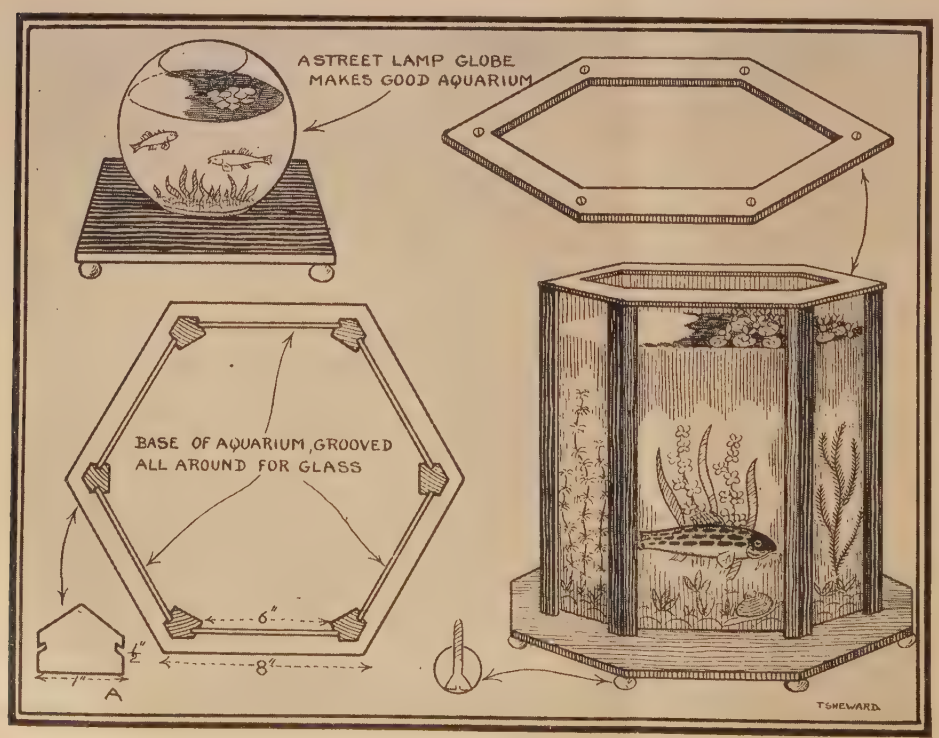
In the southern states, Washington and Oregon, where the winters are mild, early peas will be sown, also radishes, spinach, and early turnips. Sweet peas about the twentieth of the month, on well-manured land.

* * *

Where rubber plants, and dracaenas are grown, and these have become too tall, they can be air-layered, as illustrated, to make well shaped plants. The plant to be layered is cut as at "A" in the diagram, and moss tied around the cut. This is kept moist, and after a few weeks roots will start at the cut, when the top can be cut away, "B" and potted, to make a new plant. After the top has been removed, new growth starts on the old plant, which also can be layered in the same way.

* * *

An aquarium is always interesting when filled with suitable water plants and fishes. The illustrations



show how to make one. Material required will be a piece of ¾-inch dressed pine for the base, and six feet of 1″ by 1″ dressed pine for the sides. Six pieces of 6″ by 12″ glass will also be required. The 1″ by 1″ is dressed with the plane, and rebated for glass as at "A". The base is cut, marked with a pencil, and grooved for glass, ¼″ deep, then the top is cut from half inch dressed pine, as shown in the diagram. The six side sash-bars are fastened to the base with 1¼″ screws and the glass fitted into the grooves, then the top is screwed down, and water-proof cement used to make the aquarium watertight. When this is dry it is given three coats of varnish, and is then ready for filling with suitable plants and fishes, which can be collected in streams and pools, or it can be used for goldfish.

* * *

Glass and china dishes can be mended by melting powdered alum and rubbing this over the broken edges, then pressing together, and setting aside to dry. Hot water will not afterwards melt the alum.

* * *

Old newspapers placed in the bottom of the garbage pail prevents refuse sticking to the sides.

* * *

When postage stamps stick together place them under a sheet of paper, and go over it lightly with a hot iron.

* * *

Pieces of soft leather or rubber glued to the bottom of chairs will prevent them from marking the floor.

* * *

Chloride of lime or washing soda in boiling water, poured down the kitchen sink every night, will keep it purified.

* * *

Tan shoes can be cleaned with soap and water, applied with a stiff brush, so that they look like new after they have been polished again.

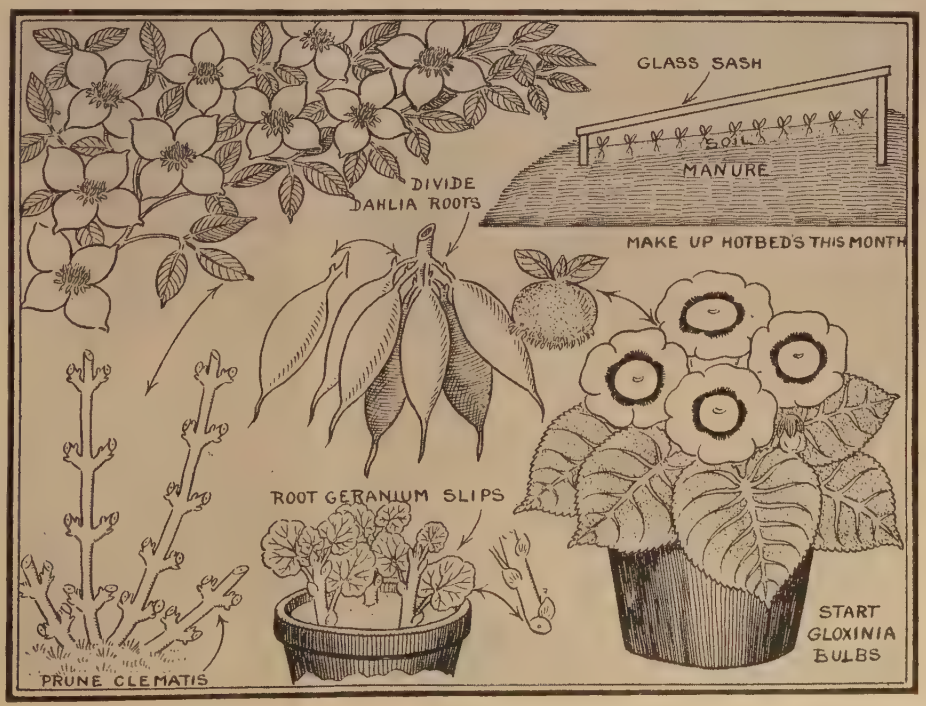
* * *

To remove ink stains from clothing, wash with boiled rice. The rice is used as soap to remove the stain, and afterwards clean water is used. Indelible ink stains are removed by soaking in salt water, and afterwards washing in ammonia. Salts of lemon is also very effective for removing ink stain. One tablespoon full to a gallon of boiling water is used.

* * *

In response to our request for suggestions and advice for this department we have received a valuable hint from LaBar's Rhododendron Nursery of Stroudsburg, Pa. They forward a booklet giving excellent cultural suggestions relative to native shrubs in which they specialize and Mr. Frank LaBar makes the following interesting comment:

"This class of plants is rightly becoming more popular all the time. In the past it was very largely only the wealthy estate owner who had them as a seemingly essential part of his landscaping, but now they are being also sought by the owners of more modest homes. More people would use them if they thought they could have proper results, and very often proper results can readily be obtained if consideration of their requirements is noted. The first consideration is that they must be regarded as savages and not too drastically put in situations entirely out of keeping with their natural mode of growth. We would be glad to help those interested."



ASSOCIATES

Prof. George R. Green, *President, American Nature Study Society.*

Prof. J. A. Hollinger, *Supervisor of Nature Study, Pittsburgh, Pa.*

Mrs. Elizabeth K. Peeples, *of the Washington, D. C., Schools.*

Prof. L. D. Wooster, *Kansas State Teachers College, Hays, Kansas.*

Miss Clelia Paroni, *Supervisor of Nature Study, Berkeley, Calif.*

Dr. Bertha Chapman Cady, *Girl Scouts, Inc.*

DEPARTMENT *of* NATURE EDUCATION

Dr. E. Laurence Palmer

Cornell University, Director

The Nature Education Family

by E. Laurence Palmer

On the day on which this is being written I received three letters from readers of this page. One from a Massachusetts publisher wanted to know if the contents of one of these pages couldn't well be expanded into a book and if so could the publisher in question examine the manuscript. A second from an Indiana Nature teacher in the elementary schools wanted to know how comprehensive she should make her work in Nature in the schools. The third was from a Nebraska high school teacher who felt that Nature Education as here outlined might be helpful in her work in biology and asked specific questions in connection with modelling her biology course along the lines here discussed.

It is most encouraging that the appeal of this page has been so general. I prefer this month to consider some of the points which should be kept in mind in planning work in Nature Education either in the elementary schools or in the secondary schools.

A rather careful examination of a great majority of the Nature outlines in use throughout the country has shown me that there is a great tendency for an outline to use Nature work to "sell" one particular faction which might legitimately be benefited by the work. One state for example emphasizes very strongly health education. Another outline builds the entire program about gardening. A third seems to think that the purpose of Nature Education is to increase the appreciation of the benefits of agriculture. Another outline makes much of humane education, and so we might continue. I know of practically no outline which offers opportunity for developing all of these fields or which offers opportunity for those using the outline to exercise their own judgment in determining which of these should be given emphasis. Those who offer these rather lop-sided programs are in some cases very insistent that their program is the only good program and are willing to back their beliefs by the influence of rather powerful organizations. This is certainly not true, however, of all of those who have been responsible for these programs.

Let me offer for your consideration a few of the units which I believe should be given consideration.

Agriculture, gardening, humane education and health education all have their place in a Nature Education program. These are, however, but a part of the list of practical applications of science which are entitled to recognition in Nature programs for school use.

With a comparatively few exceptions forestry does not appear as a theme for Nature Education. In spite of this, forestry problems demand recognition by the public. Forestry products play an important part in the lives of us all and forestry is a field which offers great appeal to children. It lends itself easily to school conditions and printed helps are easily available from the Forest Service, the American Tree Association and other organizations. A certain general science text which has appeared within the last year offers less than ten pages for forestry problems and the treatment is not in accord with present forest practice as might be determined from easily available sources. Forestry should be given a show.

Mining is an activity which contributes generously to our civilization. Its raw materials are at hand everywhere and yet provision for adequate study of rocks and minerals is rarely given in Nature and science outlines.

Rather meagre and inadequate too are the helps in the study of marine conditions. This is hardly so serious as with some other activities since so great a portion of our country does not have the opportunity of first hand study of marine conditions other than those shown by marine fossils. Outlines designed for the use of states having a coast line should, however, make provision for the study of marine life on a basis comparable to the role played by marine products in our everyday life. Unfortunately much of the information available about marine life is couched in technical zoological terms with little meaning to the ordinary individual. The committee working on a course of study for use in one of our large seaports had a great discussion as to whether help in the study of a lobster or of a clam should be given. Isn't it conceivable that adequate consideration could be given to each since each is present in abundance in the markets of the city concerned? Wouldn't it have been better to have offered the opportunity for the teachers to select any mollusk?

Industry is given more than adequate consideration in the average general science course and less than adequate consideration in the average course for the lower grades. It would seem that the emphasis could be distributed with profit over a wider range of years than it is.

Isn't it worth while to make some effort to recognize adequately the contributions of Nature Education to the great variety of vocations dependent upon an understanding of Nature? Why limit the emphasis?

Save Your Eyes

Sit Right—Read Right—Feel Right

At last—a long needed human want is filled by the invention of this great practical Necessity—

Insures Correct Posture

The Farrington *Portable* Reading Table for the Lap

Do you tire when you read? Do your eyes give out when you've barely started an interesting book? Has an unnatural, incorrect posture worked its ill effects on your health, simply because your reading hours have been uncomfortable?

Then here's a simple, scientific contribution to your *health*—to your peace of mind—to your future happiness! Here is a device you long have needed—Dr. Farrington's *portable* lap table!

Now You Can Really RELAX As You Read!

Prof. E. L. Eaton, Univ. of Wis., says: "It is a joy to read a book of any size resting easily in a rocking chair. Thousands will now have a new joy ***reading*** while ***resting.***"

Just think of the comfort and enjoyment a Farrington offers! Greater concentration. Greater facility for the mechanics of reading and writing notes. ***Genuine relaxation.***

Placed on your lap, this scientific new contribution to health supports books, magazines, manuscripts, writing materials, etc., at exactly the right distance from your eyes. It insures correct reading angle to line of vision. It is light, handy, collapsible and adjustable to any position. No skill needed in handling.

NATURE DEMANDS ITS USE
(—Prevents Eyestrain
—Insures Correct Posture
—Conserves Mental Energy
—Permits Greater Concentration
—Conserves All Vital Forces)

Endorsed by Thousands of Users

Dr. S. A. Fuqua, Chicago, says: "For years I have looked for some device that would hold a heavy book in a comfortable position. The Farrington fills the bill perfectly with no strain on the muscles of the arms or the eyes."

E. Dickenson, Dallas: "To me it is indispensable. Most convenient on all occasions—in the class room I recommend it to professors and students."

Editor D. V. Brummitt, Chicago: "I find it particularly useful in reading and I can make notes with a minimum of delay or trouble."

Rev. J. R. Hobbs, Birmingham: "I can conceive of nothing that would be more helpful to one who reads much or one confined to bed."

Samuel Quinn, Chicago: "I can sit back in my arm chair and enjoy life writing to my friends. It is a great comfort."

One of Its "Many Uses"

Indispensable to Invalids

If any of your friends or loved ones are confined in a hospital or at home because of illness, send them a Farrington. Nothing would help more to quicken long hours of suffering. Thousands of Farringtons are now used in Government and other hospitals throughout the country. Used with detachable metal legs for reading in bed, the Farrington is ideal for sick persons. ***Rev. C. G. Gunn,*** Bluefield, W.Va., says: "The two Farringtons I gave as presents have made their owners glad. One was to a gentleman who has lost full use of his hands and the other to a cousin in bed with a severe fracture of the limb. Both are delighted."

Ladies use the Farrington for Sewing, Writing, Drawing, Etc.

IDEAL FOR CHILDREN

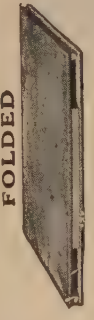
Don't let your child hump! It's dangerous! Eyestrain, distorted organs, curved spine and retardation of normal development results. The Farrington compels correct posture.

Every Child Needs It

Men, Women and Children — Every Home should have the FARRINGTON

As a reader you must recognize that here is the very thing you have always wanted—needed. It is a positive fact that its use will help you—your family—everyone in your home to conserve and prolong the life of your eyes. The benefit to your eyes alone makes the Farrington an inexpensive investment.

Usable in so many ways, it will give many years of joyful service. Beautifully finished. Light weight (less than 48 ounces.) sturdily constructed, portable, folds to one inch Size 12 x 18 inches. A handsome piece of furniture adjustable to any position.



Styles and Prepaid Prices

1. Natural Finish	$6.50
2. Walnut Finish	7.50
3. Mahogany Finish	7.50
5. Genuine Walnut	9.50
6. Genuine Mahogany	9.50

NOTE: Special detachable legs for reading, writing or eating in bed as shown above $1.00 extra.

Prepaid to any address in U. S. A.

Useful Gift

Send Your Friend A Farrington

A reading table for father. An adjustable sewing and writing table for mother. A practical study and drawing table for sister and brother. Its usefulness, practicability and novel appearance make it particularly desirable as an inexpensive remembrance for any occasion. Everyone appreciates it. Just the gift you've been seeking.

Order Now. For yourself and others. Don't delay. There is a Farrington to suit your taste and to meet your requirements in price. Just tell us the finish and style number you prefer. Your money will be refunded at the end of 5 days if you are not more than satisfied. Just enclose your personal check or instruct us to ship C. O. D.

The Farrington Company

21 W. Elm Street **Dept. N. M. 2** **Chicago, Illinois**

You'll get to the big ones sooner in this motor-driven canoe

You won't lose any time getting there when you go fishing in this "Old Town" square-stern canoe. Equipped with an outboard motor, this craft will cut through the water at a remarkable rate of speed.

The "Old Town" square-stern is wonderfully sturdy and durable too. Built to carry heavy loads. Made with or without sponsons.

New catalog gives prices and complete information about all models, including paddling and sailing canoes, square-stern canoes, dinghies, etc. Also fast, seaworthy boats for *outboard motors*—racing step-planes, baby buzz hydroplanes, etc. Write for free copy today. OLD TOWN CANOE Co., 892 Main Street, Old Town, Maine.

"Old Town Canoes"

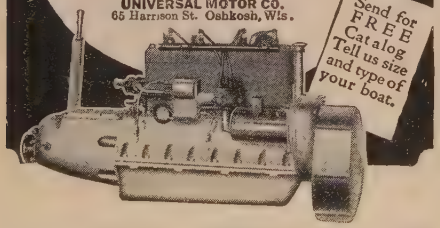
Universal

10 to 50 H. P. Marine Motors

Nothing in its class compares with Universal Super-four—*the new thrill in boating!* Tremendous power—smooth and quiet—with that delightful purr that owners of costly cars love to brag about. Speed that heretofore cost 25% to 50% more. Unbelievably compact and light, but strong with stamina to stand the gaff. Models -- GLS 15-30 H.P., (Medium Speed). GLH 25-45 H. P., (High Speed). GLR (151 class Racing Model) 50 H. P.

UNIVERSAL MOTOR CO.
65 Harrison St. Oshkosh, Wis.

Send for FREE Catalog Tell us size and type of your boat.



World's Champions select

NORTHLAND SKIS

as their first choice. Forest rangers and hunters prefer them. For sheer quality, make NORTHLANDS *your* choice. Look for the deer-head trademark. Send for free booklet on "How to Ski".

NORTHLAND SKI MFG. CO.
82 Merriam Park, St. Paul, Minn.

NATURE NEWS AND VIEWS

Nature Study Society

The annual meeting of the American Nature Study Society was held in Nashville, Tennessee on December 27 and 28 in connection with the annual meeting of the American Association for the Advancement of Science. Abstracts of the papers presented may be secured by members from the secretary-treasurer of the society, E. Laurence Palmer, Ithaca, N. Y. Those desiring to become members are asked to communicate with the secretary-treasurer. The list of new officers elected is not available as this number of Nature Magazine goes to press but will be published later. The Society will hold its usual summer meeting with the National Education Association. This year this meeting will be held in Minneapolis.

Supervisors to Meet

On February 25, the National Council of Supervisors of Nature Study and Gardening will hold its annual meeting in Boston in connection with the meeting of the Department of Superintendence of the National Education Association. The program to be presented seems to be unusually strong. The list of speakers includes the following: Russell Lund, State Supervisor of Nature Study and Elementary Agriculture of Connecticut; Dr. Edward Breck, president of the Anti-Steel-Trap League; Dr. Clarence Weed, Principal of the Lowell, Massachusetts, Normal School and Dr. Gerald Craig of Columbia University. Information concerning the meeting may be secured either from Dr. Weed or the president of the Council, E. Laurence Palmer, Director of Nature Education of the American Nature Association.

Teacher Meeting

Preliminary announcements of the meeting of the National Society of College Teachers of Education to be held at Harvard University, February 27 to 29 have been issued. A full program has been arranged. Details can be obtained from S. A. Courtis, University of Michigan, Ann Arbor.

When you're miles from a lamp-post

and it's so dark that a Senegalese looks like an Albino, that's when you need a good flashlight to blaze a trail of safety. Every outdoors man and woman needs one, as a matter of fact.

Get a flashlight, by all means, and keep it "loaded for bear" with power-packed Eveready Batteries. Be sure they're Eveready and you'll be sure of bright, white light when you press the button. The battery DOES make a difference. Buy the best and you take no chances.

The flashlight habit is a healthy one. It's a step in the LIGHT direction!

Fast!...Silent!...Sturdy!

They're Different **"CHICAGO"** TRADE MARK REG. U.S. PAT. OFF. **Rubber Tire Roller Skates**

Fast, because the high speed, ball-bearing disc wheels spin ten times longer; *Silent*, because the shock-absorbing rubber tires are noiseless and glide smoothly over cracks and uneven surfaces; *Sturdy*, because "CHICAGOS" are built like a fine piece of machinery, and the special composition rubber tires outwear steel wheels. And they are *safe* because the rubber tires prevent slipping.

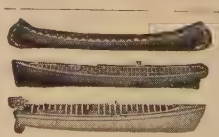
ROLL ON *Rubber* **Stop With Four-Wheel Brakes**

Rubber tires cannot loosen or come off, balls cannot get out of bearings, and wheels cannot get out of adjustment.

Write for this FREE Book

A complete instruction book on roller skating—correct starting and stopping, proper position of body, how to go faster, games, etc., etc.

Chicago Roller Skate Co.
Established Over 20 Years
4451 W. Lake Street Chicago, Ill.



Better Boats
At Lower Prices

Inboard and Outboard Motor Boats, Canoes, Rowboats and Dinghies. **Catalog Free!** Save money—order by mail. Please state kind of Boat you are interested in. Two big factories. Prompt shipment.

THOMPSON BROS. BOAT MFG. CO. (19)
207 Ann St., PESHTIGO, WISCONSIN (*Write to either place*) 107 Elm St., CORTLAND, NEW YORK

KENNEBEC CANOES

$59.75 up.

Graceful, fast, sturdy. Also speed boats, rowboats, paddles. Get Catalog.

THE KENNEBEC CANOE CO.
Dept. T-41 Waterville, Maine

Buy Direct at Dealer Prices

Wire Netting at Wholesale

A big saving on wire netting in all sizes for any type of bird or animal enclosure. Wholesale prices and prompt delivery from our large stocks at Clinton, Mass.: Chicago, San Francisco, Seattle and Minneapolis.

Free Catalogue on Crown Pen Materials

Crown Iron Works Co. 1253 Tyler St., N. E. —Minneapolis

The COMPLETE Works of

O. HENRY

in ONE Volume

—and the price is only

$2.98

Every story O. Henry ever wrote—273 in all—for *about one cent per story!* Everything included in the 18-volume set, now in ONE volume—at a price that will place America's greatest short-story writer in every American home.

SHE saved pennies—out of his $8-a-week salary—but at Christmas time she had only $1.87, not enough to buy him a chain good enough to go with his much-prized watch. He, too, skimped and scraped, to buy her a beautiful comb for her still-more-beautiful hair. She sold her hair to purchase the chain—while he sold his watch to purchase the comb—

Only O. Henry could have written "The Gift of the Magi"—one of the most charming, most pathetic, most lovable stories ever written in any language. You will read it again and again, as you will read every one of the 273 O. Henry tales contained in this single volume.

Turn to ANY O. Henry story and you will read the best one! Short, pointed, witty stories, sprinkled with the language of the gutter, the boarding-house, the stage, the barber shop, the police force, the thief, the hobo, the clubman, the society matron. O. Henry lays bare the souls of real people whose pulses you feel, whose hearts you see flutter, whose tears blur your own vision, whose laughter infects *you*, whose aches and pains and joys you actually share. No other writer of the short story can twist your own emotions at will as does O. Henry. That is why millions love him. That is why tens of thousands of sets of his works have been purchased for as high as $24.50 per set. That is why the rights to O. Henry stories were eagerly purchased by hundreds of newspapers. That is why O. Henry captured movie audiences the world over.

Not One STORY Left Out

And now O. Henry *complete*—every story he ever wrote—has been placed between the covers of a single volume. And to insure the widest possible distribution—to make O. Henry the *universal* Short Story Classic of America, the publishers have placed the price at only $2.98.

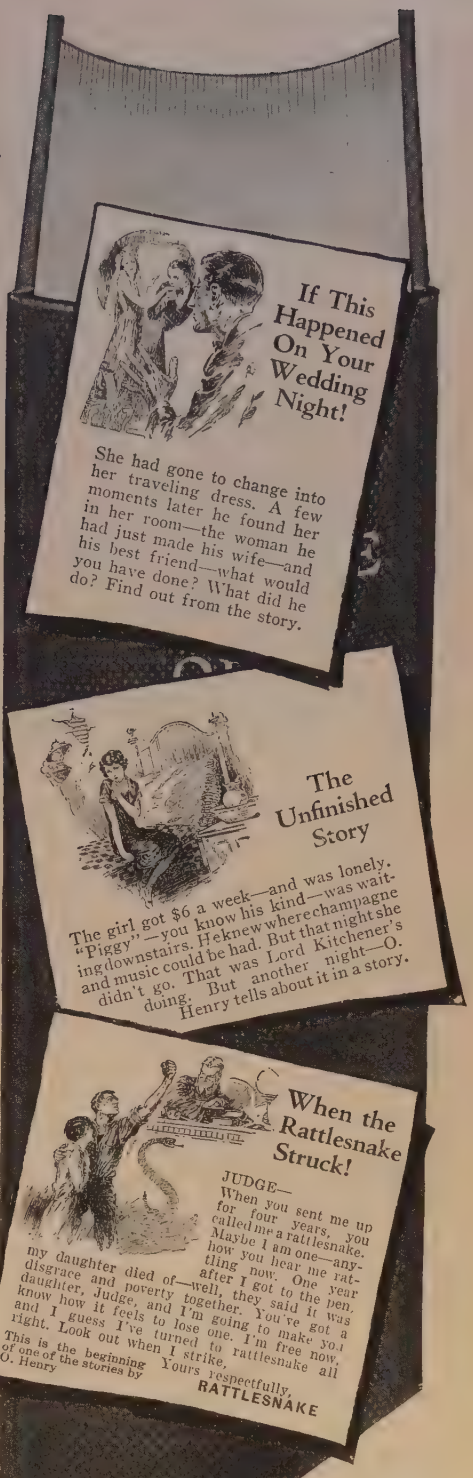
Never has there been a short-story writer like O. Henry. Never before have his works been placed in one volume. Never before could you obtain his works for anything like the present price.

The volume contains 273 stories, as well as many biographical sketches of O. Henry. There are nearly 1400 pages printed on opaque thin paper, in large, clear, readable type, beautifully bound in cloth. The book measures 5½ inches by 8½ inches and is only 1½ inches thick. It is a volume fit to grace any library or living-room table—and its contents are fit to grace the mind of every American.

So confident are the publishers that you will appreciate the enormous value offered in this volume at only $2.98 that they offer to send it on a week's trial.

Send No Money

Send no money now. Just mail the coupon. When the postman delivers the book give him $2.98 plus postage. Then revel in O. Henry for a week. If you can bring yourself to part with the volume, return it and your money will be refunded at once without question. Write now, as the present edition is limited. NELSON, DOUBLEDAY, Inc., Dept. H-592, Garden City, New York.


If This Happened On Your Wedding Night!
She had gone to change into her traveling dress. A few moments later he found her in her room—the woman he had just made his wife—and his best friend—what would you have done? What did he do? Find out from the story.
The Unfinished Story
The girl got $6 a week—and was lonely. "Piggy"—you know his kind—was waiting downstairs. He knew where champagne and music could be had. But that night she didn't go. That was Lord Kitchener's doing. But another night—O. Henry tells about it in a story.
When the Rattlesnake Struck!
JUDGE—
When you sent me up for four years, you called me a rattlesnake. Maybe I am one—anything you hear me rattling now. One year after I got to the pen, my daughter died of—well, they said it was disgrace and poverty together. You've got a daughter, Judge, and I'm going to make you know how it feels to lose one. I'm free now, and I guess I've turned to rattlesnake all right. Look out when I strike.
Yours respectfully,
RATTLESNAKE
This is the beginning of one of the stories by O. Henry

NELSON, DOUBLEDAY, Inc.,
Dept. H-592,
Garden City,
New York

Please send me the complete works of O. Henry, containing 273 stories, in one volume, bound in rich Bagdad red cloth. I will pay the postman $2.98 plus carrying charges. You are to return my money at once if I return the book within a week after its receipt. *(Outside U. S., $3.48; cash with order.)*

Name.....

Address.....

City.....*State*.....

☐ If you want the handsome fabrikoid binding stamped in gold, check here and pay the postman $3.95 cash plus postage. *(Outside U. S., $4.98; cash with order.)*

Grow Grapes LIKE THESE

(One of our 3 year old plants)

Plant Our "Big Buster" Size Grape Vines

Big, Juicy Grapes for Delicious Grape Juice. Nothing quite so sure to grow, nothing quite so sure to bear, nothing quite so sure to please every taste. Nothing unusual for these large plants to fruit first year planted. Planted this spring should produce fruit first season. *Extra large, extra old, extra fine 3-year old plants that should fruit next fall.*

GLEN BROTHERS, INC. Rochester, N. Y. — *Lexington, Ky. February, 23, 1927*

DEAR SIRS: Two to three years ago, while living in the Kentucky mountains, at Coxton, I bought from you a Niagara grape that bore the year it was set out. I am now living at Lexington, Ky., and have a little room in my yard for a few vines. I want one each of a Niagara, Delaware and Champagne grape that will bear this year. Have you them? If so, please let me know the price.

Yours Truly,
463 Oldham Avenue — F. A. A.
(Name on request)

SEND FOR FREE 1928 CATALOG

Write for our catalog, profusely illustrated in color, telling how, what and when to plant. Sent postpaid.

GLEN BROTHERS, Inc.
Glenwood Nursery
2002 E. Main Street Rochester, N. Y.

500 GLADIOLUS BULBLETS AND GROWING INSTRUCTIONS 50c

50 each of 10 fine named var. plain and ruffled	$ .50
40 Ruffled Gladiolus, fine var. blooming size mixed	1.00
72 First year glads plain and ruffled mixed	1.00
10 Fine named Iris, 10 colors, labeled	1.00
10 Hardy perennials ass't'd $1.00, 10-1 year peonies	1.00
3 Named Iris, 3 Peonies, 3 large glads, 3 perennials	1.00
Large Regal Lily bulbs 1½-inch diameter each	.50
One year Evergreen tree Seedlings assorted 10 for	1.00
20 First year Regal Lily bulbs $1.00, Seed 25c pkt.	

Shiloh Gardens, P. O. Box 650, Omaha, Neb.

TEN CACTI

Blooming size — All different

Postpaid for $2.50

JAMES ALLAN
Mountain Park — New Mexico

FOR SALE

Cedar (white) trees, any height up to 10 ft. 50 cts. per ft., f. o. b. Reed City, buyer paying carrying charges.
Angus Graham, R. 3, Reed City, Mich.

Plant Nut Trees

In the search for attractive trees for planting on the home grounds there seems to be one group of trees that has been most generally overlooked. This group is the nut-bearing trees that have great possibilities of beauty and of service. The impression seems to be abroad that they are slow-growing and therefore undesirable. Let the one who believes this investigate the habits of the propagated varieties of the black and English walnut, the hardy northern pecan or the filbert. He will discover that these varieties bear early and grow as rapidly as the maple and other quick shade trees. They are worked on transplanted stock in the nursery and this increases the transplanting ability of the trees.

Now that the pecan trees have been developed to be hardy as far north as Canada, they vie with common hardwood trees for decoration. The black walnut in improved varieties,—particularly the Stabler and Ohio varieties,—is an attractive foliage tree for the home and the English walnut grafted on the black is interesting. The dwarfish tree of the filberts is unique for informal hedges and lawn specimens. The grafted trees, however, are always the best. Give consideration to the nut tree in planting your grounds.

Outdoors Popular

Added testimony to the growing popularity of the outdoors is found in the announcement of the Universal Motor Company of Oshkosh, Wisconsin, that the demand for outboard motors has made necessary the building of a large new manufacturing plant near Lake Winnebago.

Flying Squirrels

E. F. Pope of Woodville, Texas, comes to the defense of flying squirrels as pets. He asserts that he has had them about the house for thirty years and never suffered any damage from them, providing them with a small nest box, plenty of warm nest material, food and water and a wheel to turn. While the flying squirrel is nocturnal in its habits in the wild state, Mr. Pope says, it can easily be taught to be active during the day and sleep at night. He adds that he has some squirrels which turn a wheel by the hour during the day and scamper about the house with amusing antics. He takes exception to a statement in

Scott's Creeping Bent for Perfect Lawns!

Sod in six weeks! A rich, velvety stretch of lawn that chokes out weeds before they can grow! With proper care no reseeding is ever necessary. You will have a deep, thick, uniform turf that's everlasting and makes your home a beauty spot. That's what you'll get if you plant Scott's Creeping Bent.

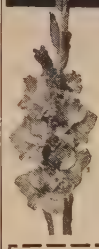
The New Super-Lawn

Creeping Bent—long recognized as the ideal grass for golf putting greens—is now producing Super-Lawns. Instead of sowing seed, you plant stolons or the chopped grass—and in a few weeks you have a luxuriant lawn like the deep green pile of a Turkish carpet.

This little book "Bent Lawns" is free to you. It is a valuable treatise on how you can have beautiful lawns. Write today for your copy.

O. M. SCOTT & SONS CO.
161 MAIN ST. • MARYSVILLE, OHIO

Write Kunderd for *Free* Gladiolus Book



FOLLOW instructions in Kunderd's *free* Gladiolus Book for the finest gladioli in town. Directions are simple, but make success sure. Hundreds of varieties described. Also two new types, the Snapdragon and Recurvii Gladioli. Sixty-eight pictured in color. Use the coupon.

A. E. KUNDERD, Lincoln Way West Goshen, Ind., U. S. A.
The originator of the Ruffled and the Laciniated Gladioli

A. E. KUNDERD, 410 Lincoln Way West Goshen, Ind., U. S. A.
Dear Sir:
Please send me your *free* Gladiolus Book.
Name_____
St. or R. F. D._____
City_____ State_____

Delphiniums 2 PACKETS 75¢
Monstrous, long spikes
Plants, 2 for - - 75c.
" Doz. - $4.50

ROSES Two-year, own-root. 75c. each; 3 for $2.20; 6 for $4.25; dozen for $8.25.

Guaranteed Hardy and to bloom from early summer to freeze-up.
DAHLIAS 10 Rare Varieties $2

Order now. We ship at Planting time. We pay postage on everything.
FREE 140 page catalog of Seeds, Bulbs, Shrubs, Plants.
JOHN LEWIS CHILDS SEED CO. Inc.
63 Childs Ave., Floral Park, N.Y.

Walsh Garden Tractor
and Power Mower
Plows, Seeds, Cultivates, Mows Lawns & Hay
For Gardners, Florists, Fruitmen—Walk or Ride
SPECIAL FACTORY PRICE
Single & Twin Engine-Belt Jobs. Catalog Free
WALSH TRACTOR CO. Minneapolis, Minn. 3324 Talmage Av. S.E.

our Questions and Answers column about the squirrels, which emphasized their nocturnal habits and destructive tendencies. This answer was correct as applied to wild flying squirrels out of which one attempted to make pets. Training, of course, can do much, and apparently Mr. Pope has had success in this direction.

Avicultural Society

The Avicultural Society of America has been formed with the purpose of studying foreign birds in captivity and disseminating among its members information on the care, breeding and feeding of birds and the perpetuation of threatened species. Its headquarters have been established at 4 West 43rd Street, New York City. The president of the Society is Mr. William H. Browning and its Secretary Mr. B. F. Lippold.

Rocks and Minerals

Organization of kindred souls into an association to be known as the Rocks and Minerals Association is being undertaken by the publisher of *Rocks and Minerals,* a quarterly publication for collectors in the field of mineralogy. The aim of the society would be to provide a community of interest for amateurs in this field and further popular interest in it. Further information can be obtained from Peter Zodac, 157 Wells Street, Peekskill, New York.

Garden Plan Contest

An open garden competition for plans for the grounds surrounding the museum of the City of New York, with first and second prizes of $100 and $50 respectively, is announced by Mrs. Willard C. Brinton chairman of the Competition Committee. Plans are to be submitted before 12 noon, March 1, 1928. Further information may be obtained from Mrs. Willard at 36 W. 59th Street, New York City.

A Good Slogan

"Keep America Beautiful" is the slogan adopted by the New York Federation of Women's Clubs in their conservation program the details of which are in charge of Mrs. C. C. Marshall, New York City. Large cards carrying this slogan are being distributed throughout schools and clubs in the State, with considerable effect, Mrs. Marshall reports, and "Keep America Beautiful" has been the subject of several speeches she has made throughout the state before Women's Clubs.

Beautify
Those Bare Unsightly Places
Benefit
Those Dear Old Struggling Trees With
PACHYSANDRA
The Plant that grows in the
SHADE
and duplicates Forest conditions

Used and endorsed by Landscape Architects

Grown in great quantity by

HUGH B. BARCLAY
Specialist in Ground-Cover Plants
NARBERTH, PA.

Free Garden Book

Planning a garden is next to the joy of eating what you raise in it. You'll find my **New 1928 Free Garden Book** will make of your planning a pleasant pastime—the information it contains will solve your planting problems and make your selections of **"what to plant"** easy, while the results will be highly satisfactory.

Larger and Better than Ever

Our Free Garden Book this year is the largest and most complete we have ever issued—Send for it today. Every person interested in seeds will find it valuable.

SONDEREGGER NURSERIES & SEED HOUSE
Carl Sondereggar, Pres.
134 Court St., Beatrice, Neb.

A GUIDE TO THE BEST
Trees, Shrubs, Plants

Roses, perennials, dahlias, etc., to beautify your home and make your orchard and garden profitable. New red barberry and other new rare varieties. For 50 years devoted to growing the best at surprisingly low prices. Buy direct. Write today for 1928 catalog. **It's free.**

WOODLAWN NURSERIES **895 Garson Ave., Rochester, N. Y.**

BEAUTIFUL GLADIOLUS

RAINBOW COLLECTION—1 bulb each of 30 different varieties, many rare colors, including lavender, orange, rose, Holland Giant, etc. Would cost nearly $3, if separately labeled. Sent postpaid with easy planting directions, for only $1. Will bloom this Summer.

Send for my interesting 36-page illustrated Gladiolus Catalog. It's free.

H. M. GILLET, ***Gladiolus Specialist***
Box 458 **New Lebanon, N. Y.**

SEE ANNOUNCEMENT PAGE 74

5 FINEST MONTHLY ROSES $1.95 Postpaid

Strong-Rooted 2- or 3-year-old Bushes; Nearly 2 ft. High

To Add Quickly 1000 Customers

We make this remarkable SPECIAL OFFER on the finest, fragrant varieties:

COLUMBIA, newest big pink; GOLDEN OPHELIA, rich yellow; PREMIER, rose pink; BUTTERFLY, apricot blending to rose pink; AMERICAN LEGION, fragrant new deep red.

Every bush has already bloomed:

GUARANTEED

TO GROW AND BLOOM For You, or Money Back

Pick regular, long-stemmed hot-house roses all summer and until frost comes.

ACT NOW Low price holds good only till limited number of collections is sold. Send $1.95 today—all five bushes mailed postpaid to your home when planting season opens. If beyond the Mississippi River, add 20c.

FREE *Collins 1928 HELPFUL GUIDE—Includes special offers on Dahlias, Chrysanthemums and other Perennials, Gladiolus, Climbing Roses, Evergreens, Privet and Barberry Hedge, Flowering Vines, Fruit Trees, Grapes and Berry Plants.*

COLLINS NURSERIES
Established 1860
Arthur J. Collins & Sons, Inc.
Box 96 MOORESTOWN, N. J.

400 acres in nurseries and fruit trees

120 FLOWERS IN FULL COLOR

The Most Beautiful Seed Catalog

This is a seed catalog unlike others, a beautifully illustrated magazine of home gardening information, the culmination of 52 years of thoughtful service to American home gardeners.

Vaughan's Gardening Illustrated contains the most complete collection of correct illustrations of annual flowers in true colors ever published in an American Seed Catalog. Also many inspirational

ARTICLES by EXPERTS

on latest fashions and discoveries in the art of gardening. Special 1928 introduction, California Canterbury Bell (Whitlavia) annual, pkt. 10c. Catalog sent with seed or mailed alone free.

VAUGHAN'S SEED STORE, Dept. 35
10 W. Randolph St., Chicago 47 Barclay St., N. Y. City

Native American Shrubs

Kalmias

Rhododendrons, Azaleas

Highest quality plants shipped from the Appalachian Mountains in any quantity. For specimen and special planting we furnish nursery-grown stock from our Stroudsburg nursery.

Catalogue of Nursery-grown Plants, Cultural Directions, etc., Mailed on Request.

LA BARS' RHODODENDRON NURSERY
1104 Bryant Street Stroudsburg, Penna.

ROSES *of New Castle* is the title of a beautiful book on the culture of roses and other plants; gives expert experience of a lifetime. Exquisitely illustrated in natural colors; offers and tells *how to grow* our famous plants. Write for your copy. *It's free.*

HELLER BROTHERS CO.
Box 210 New Castle, Indiana

Well! Well! Well!

Here is a variation on the Mary's lamb story that comes from Albert Wisendanger of the U. S. Forest Service. A ranger, he was visiting schools in Douglas County, Oregon, spreading the gospel of preventing forest fires. Waiting for the principal at the Olalla grade school, he noticed a brown pigeon pacing the doortop near the transom.

"How come the pigeon?" the ranger asked when the principal came.

"Oh," the head of the school said, "it belongs to one of the boys. The bird follows the boy a mile and one-half to school every day and roosts outside until school is over and then follows his partner home. If a window or door is open he flies into the school room and roosts all day on George Washington's picture."

The ranger inquired around about this boy and his pet. He found that the boy is Morris Shepard and sits in the third grade. Furthermore, if Morris sees any boys throwing rocks or hurting birds or animals, there is, forthwith, a row. Morris knows what it is to have a true friend in a bird.

Davey Hunts Trees

Armed with a camera and a tree borer, James A. G. Davey, tree expert, recently left New York City to hunt rare trees in New Zealand, Tasmania, Palestine and Switzerland. He will visit especially the ancient oak standing beside the grave of Abraham, and a horse chestnut of Mt. Aetna 160 feet in circumference. In Switzerland the object of his quest will be the purple birch.

Snakes Traffic-Wise

Wild life is adapting itself to the dangers of traffic over our highways according to Raymond L. Ditmars of the New York Zoological Park, who has recently made an extensive trip through New York State. Snakes appear particularly wise, he says, having observed one that sought out a roadside culvert, then looked up and down the road and, seeing everything clear, wriggled across. The porcupines, however, seem to be unable to get the idea of how to handle themselves on travelled roads.

Kinkade Garden Tractor and Power Lawnmower

A Practical Proven Power Cultivator for gardeners, suburbanites, Truckers, Florists, Nurserymen, Fruit Growers, Country Estates and Poultrymen.

AMERICAN FARM MACHINE CO.
1036 33rd Ave. S. E. MINNEAPOLIS, MINN.

Good seeds *~grown from* **Selected Stocks**

New crop, tested seeds sure to produce. Noted for their vitality. Sold for 58 years to satisfied customers. Prices reasonable. **Extra packages free with every order.**

Free Large catalog with 700 pictures of vegetables and flowers. Send yours and neighbors addresses today.

R. H. SHUMWAY
Dept. № 85 Rockford, Illinois

This Seed and Plant BOOK *is* Ready for *YOU*

It tells about reliable Flowers and Vegetables that have proved best in many home gardens similar to yours. Also many new kinds, tested and found very superior.

It pictures and describes a wonderful and entirely new Blue Hardy Poppy; New Mammoth Flowered Zinnias; New Chrysanthemum-like Asters; Greatly improved Annual Larkspur in 6 brilliant colors.

NEW VEGETABLES

Sunshine Sweet Corn—Onward Pea; New Gladiolus. Dahlias. Shrubs. Best of everything for lawn and garden. Send for this book today. It's FREE.

HART & VICK—SEEDS
60 Stone Street Rochester, N. Y.

FAMOUS DINGEE ROSES

Send for hints on rose gardens, "78 Years Among the Roses," new manual for beginners and others. Our illustrated catalog, "New Guide to Rose Culture," offering over 500 roses, plants, seeds and bulbs, also free on request. Dingee roses favorites for 78 years. Grown on own roots. Safe delivery guaranteed. Send $1 for our trial offer of 8 bushes. Use coupon.

The Dingee & Conard Co., Box 207, West Grove, Pa.
Please send me "78 Years Among the Roses" and 1928 catalog. The enclosed $1 is for your special offer of 8 bushes.
Name _____
Town _____ State _____

10 CACTI POSTPAID FOR **2.50** (RARE SPECIMENS)

Handsome catalogue with very large assortment of fresh cacti seeds, only 25c. Catalogue has many Bargain offers and cultural directions.

DESERT PLANT COMPANY
Station A, Box 95 El Paso, Texas

World's Largest Dahlia Grower

Send today for my Free large Catalogue on Dahlias, Glads, Iris, Peonies, Phlox, Flowering Shrubs and Perennials.

J. K. Alexander (The Dahlia King)
107 Central St.
East Bridgewater, Mass.

Robins Halt Industry

"Two robins are nesting on the crane girder in the main bay. Any man who intentionally molests them or causes them to leave their nest can draw his time."

The hard-boiled riveters and steel construction men working on a new Portland, Oregon, skyscraper gasped when the above order came from the head office. But they delayed work about the section where the two birds with three blue-tinted eggs had established housekeeping arrangements. Soon the eggs hatched, and little chirps mingled with the jangle of steel riveters and the whistle of donkey engines. Finally the whole family flew away with never a thank you, and the wheels of industry began to turn once more about their deserted home.

Forest for Michigan

Eight thousand acres of forest land including 78 acres of virgin and unmixed white pine have been presented to the State of Michigan for preservation as a State Park. It is the gift of Mrs. Karen B. Hartwick, of Ann Arbor, widow of a lumberman and member of a pioneer family. A log museum that will house materials and data constituting a history of the lumber industry of the State will be erected in the tract, which is located about eight miles north and east of Grayling.

Forest for Florida

With a gross area of 252,000 acres, the Ocala National Forest has been created as a single administrative unit and added to the list of our National Forests. This change, which separates the Florida National Forest, gives that state two forests under federal administration.

Bagging the Bagworms

What has been accomplished by the school children of Kansas City, Kansas, in the way of control of insect pests is a fine suggestion for use elsewhere. It is, also, an interesting story. The start was in the ninth grade science class in Central Junior High School, whose teacher was Miss Lena V. Feighner. A discussion of bagworms developed into exhaustive research into the life cycle and habits of these pests. It made every one in the class an expert on these busy devastators of trees, and how to collect the bags. When a problem arises experts are in demand and the science class became a group of crusaders, armed with accurate information, to stir up

HARDY PLANTS
That Really Are Hardy

Winter tested, every one. Good, husky, full rooted plants, the best that money can buy. Still the prices are entirely reasonable.

By hardy plants, we mean rock plants, as well as the regular perennials. Make rather a specialty of rock plants.

You'll find them all more than usually well described in our new catalog. Practically every one is illustrated in goodly size. Makes selecting easy and sure.

Don't send postage for catalog. That's our part. Just write you want it.

Wayside Gardens
Mentor, Ohio
Reg. U.S. Pat. Off. E. H. Schultz, Pres. J. J. Grullemans, Sec'y-Treas.

Maloney's

Hardy, Field-Grown Bushes That Will Bloom This Year

Let us send you this fine Collection of everblooming Roses. It includes 5 choicest Hybrid Teas—all true-to-name and guaranteed to grow—Maloney's Guarantee.

Here they are: Killarney White; Mad. C. Testout, rich dark Pink; Red Radiance, Crimson-Scarlet—a profuse bloomer: Francis Scott Key, Red, almost Cerise, beautifully formed; Ophelia, popular because of its beauty and coloring—light Salmon, shading to Yellow.

Send your order today with $2.50 and we will send you this excellent Collection in time for early Spring planting. Remember, every plant has our guarantee.

You Need Our 1928 Nursery Book—FREE

Contains a thousand items of interest to you. Over 100 illustrations in natural colors. Write today.

We pay transportation charges. See Catalog.

Maloney Bros. Nursery Co., Inc.
117 Main St. Dansville, N. Y.

Growers for 44 Yrs.

Dreer's Garden Book

FOR years the guide book of amateur and professional gardeners in the successful growing of Vegetables and Flowers. The new edition is the best yet, with its hundreds of illustrations and color plates of all that is best in Seeds, Plants and Bulbs, and its valuable and interesting cultural information.

A copy free if you mention Nature Magazine

HENRY A. DREER
1306 Spring Garden St., Philadelphia, Pa.

Free HOW TO PLANT

This valuable little booklet "How to Plant" will help you. Sent **free** with our big 1928 catalog that lists everything needed for tastefully landscaping your home. Standard and rare varieties. Shrubs, Trees, Evergreens, Perennials, Bulbs and Fruits. **SPECIAL**—*3 Blooming Size White Regal Lily Bulbs for $1.00 Prepaid.*

THE COLE NURSERY CO.
Box 15 Painesville, Ohio

50 acres devoted to Peonies
10 acres devoted to Iris

With more than 200 varieties of each. Peonies and Iris will add to the value and beauty of your property. Our prices are right.

Write for catalogue

GILBERT H. WILD & SON
SARCOXIE, MO.

GOLD MEDAL DAHLIAS

greatest prizewinners in America

Your garden can grow good Dahlias if you BUY GOOD Dahlias. Our Dahlias, in five consecutive years won Gold Medal of the N. J. Dahlia Soc.; four consecutive years Gold Medal New York, greatest show in America. Hundreds of other awards. Whether for your own enjoyment or exhibition, your satisfaction is assured with Dahlias from **"Sanhican Gardens"**—our customers are winning all over the States.

Trentonian

Margaret Woodrow Wilson

"Amateur's" Collection

	List Price		List Price
Trentonian: Gold and coppery bronze	$2.00	**Pop Stewart:** Delicate lilac-pink	$2.00
Jersey Beacon: Chinese scarlet	2.50	**Gilda Gray:** Lilac and Tyrian rose	1.50
		Total value	$8.00

The above four (one of each) for $5.00

"Exhibitor's" Collection

	List Price		List Price
Marg't Woodrow Wilson: Opalescent pink	$4.00	**Trentonian** Bronzy orange	$2.00
Sanhican Gold 'Sunset' color	2.50	**Jersey Beacon** Chinese scarlet	2.50
Jersey Beauty Grand pink	1.00	**Emma Marie** Pink & white	2.00
		Total value	$14.00

The above six Magnificent Dahlias for $10.00

All the above fully described in our catalogue—the leading one of its kind, mailed free to all who request a copy.

FISHER & MASSON

America's Most Successful Dahlia Growers

Sanhican Gardens (Box N) TRENTON, N. J.

MAULE'S SEEDS

ALL Maule Seeds teem with Vigorous, Healthy Life. Always they are Tested, always they are Guaranteed. For 51 years the favorite of thousands of farmers, and gardeners. For 51 years we have been selling the highest class seeds and bulbs at the lowest prices. All Maule Seeds are TESTED and BONDED with a Money-Back Offer.

Maule's 1928 Seed Book Free

Contains valuable garden information; pictures and describes more than a thousand varieties of the finest vegetable and flower seeds, bulbs, roots, roses, and shrubs. Write for your copy of Maule's Seed Book Today; it's Free.

WM. HENRY MAULE

166 Maule Building, Philadelphia, Pa.

NEW WATER FERN

Beautiful House Plant --- REQUIRES NO SOIL

THRIVES IN A VASE OF WATER

A peculiar and interesting plant that is admired by everyone; handsome, velvety, fine, fern-like foliage. Curls up and goes to sleep when taken out of water, and keeps in its sleeping or dormant state for weeks and awakens again in a few minutes after being placed in water. Owing to the fact it is capable of sleeping and awakening repeatedly, it is called the Opossum Fern. Do not confuse this plant with the much advertised Resurrection plant.

If you want one of the most satisfactory and beautiful "Table Ferns," something entirely new, get one of these marvels of plant life. Plants, **25c each; 3 for 50c; 7 for $1.00,** postpaid. **BURGESS SEED & PLANT CO., 340 W. F., GALESBURG, MICHIGAN.**

BUIST'S SEEDS

Best for 100 YEARS

and still Serving the Wisest Buyers

Our 1928 Garden Guide and Catalog

Contains Special Anniversary Offers and Free Premiums

Write for 136-Page FREE Copy Today

ROBERT BUIST CO., DEPT. O PHILA., PA.

DAHLIAS

LOOK FOR THE TRADE MARK WHEN LOOKING FOR QUALITY

For over a third of a century this Trade Mark has stood for quality and fair dealing. Stock true to name, strong and free from disease. Catalogue free. Send today—this ad will appear but once. 42 years a specialist.

W. W. WILMORE
Box 382
Denver Colorado

50 Large Gladiolus $2.00

No two alike. All labeled and selected to cover the entire Gladiolus color range. Or 60 bulbs in 10 choice varieties and colors separately labeled for $2.00 all postpaid. Both collections to one address $3.75. Write for catalogue describing 100 varieties, also other collections.

TERRACE GLADIOLI GARDENS
Stevensville Michigan

BROWN DAHLIA FARM

Grower of 150 different varieties of Dahlias

Send this AD and $1.00 and receive 2 Dahlia tubes (worth $2.00) and my catalogue free.

W. F. BROWN, Uncasville, Conn.

NUT CROPS

The North's future soil production

Progressive farmers are planting groves of improved grafted nut trees. Learn why. Read "Save America's Nut Heritage & Nut Grower".

JOHN W. HERSHEY, Nut Trees, Downingtown, Pa.

the entire school. Then the movement spread to other schools and the first campaign accounted for some 780,000 bags, or about 93,600,000 potential hungry bagworms. One of the greatest results of the campaign, which was repeated with similar results this year, has been the education of the adults to the menace of these insects. We wish space permitted a more detailed story of the campaign in Kansas City, but at least we can extend our congratulations to the science class, their able teacher and the school children of the city.

An Animal Cargo

A shipment of 1200 mink, 150 silver foxes, 12 raccoons, and 42 muskrats, to be delivered to animal farms and ranches in different European countries, recently left the United States on the Hamburg-American ship, *The Cleveland*. They will be used for breeding purposes. The muskrats were sent over as an experiment to determine whether or not their propagation in the marshes of Czecho-Slovakia is possible and practical.

Lobsters Home-Lovers

Lobsters are home-loving creatures, seldom wandering far from their own under-sea dooryards where they and their parents were born. This is the conclusion reached by Mr. E. M. Poulsen, who has been studying the conditions of the lobster fishery in the North Sea on behalf of the government of Denmark. Living lobsters were caught and notches were cut into the hard cuticle of their tails, not unlike the similar method of identifying domestic animals by cuts in the edges of the ears. These "ear-marked" lobsters were then released at the place where they had been caught. Later catches made in that and other neighborhoods were watched for the reappearance of the notched lobsters. No notched individual was caught at any greater distance than fifteen miles from the spot where it had been released. Only a few wandered as far as five miles from home. The majority stayed within a mile or two. Almost the whole lobster population does seem to take part, however, in an annual migration; down to deeper water in winter and back again to shallower water in summer. Even this involves no long journey, for the shallows and deeps are not far apart. A few individual lobsters may become explorers and adventurers, as a few human beings do, but the majority seem to be content with the humdrum existence of home.

Glorious Gardens

The best is none too good for *your* garden. If you have never known about "Kentucky Bred" flowers, write for our 1928 "Kentucky Bred" Garden Book. Plan for a bit of Kentucky's beauty in your garden. Search the world over and you will never find better quality and more satisfaction.

Write for your Garden Book Now

Jacob Schulz Co., Inc.

Dept. I

550 Fourth Ave.
Louisville, Ky.

Star Roses

Our "Star Guide to Good Roses," 100 pages profusely illustrated in color, pictures and describes over 200 rose varieties. It also tells about America's twelve best roses—universally liked and most satisfactory for garden use—the twelve roses that grow well and bloom profusely almost everywhere.

"Star Roses," the only trade-marked roses, are guaranteed to bloom—thus you are assured rose satisfaction. The "Star Guide" is FREE—write today!

The Conard-Pyle Co.
Star Rose Growers
Robert Pyle, *Pres.* Box 28
West Grove, Pa.

Guaranteed to bloom

WATER LILIES

(Queen of Garden Flowers)

Planted from April to end of August. Rich, gorgeous colors. Delicate fragrance. Easy to grow.

75 VARIETIES

of the rarest and finest Water Lilies from the largest Aquatic Gardens in America. Big, hardy roots **guaranteed.** Send for Catalog NOW.

The W. B. SHAW
Aquatic Gardens
Dept. A. *Kenilworth*
WASHINGTON
D. C.

NATURE-LOVERS WILL WANT

KEMP'S CATALOGUE

of wonder Dahlias & Gladiolus

FEATURING a notable array of prize-winning varieties, this 28-page Catalogue with 17 photographic illustrations will be valuable to you—and is yours for the asking.

J. A. KEMP GLAD-DAHLIA SPECIALIST
BOX 181 - C - LITTLE SILVER, N. J.

New Habitat Group

Warm sunrise on the Panama Canal, with birds alert and seeking food, while a merchant ship creeping south along the blue canal waters peers through the foliage, comprise the new bird tableau recently exhibited at the Hall of Habitats at the American Museum of Natural History, New York City. Over 60 birds, natives of the Barro Colorado Island, Canal Zone, including macaws, parrots, toucans, woodpeckers, motmots, trogons and cotingas, form the central part of the exhibit. Barro Colorado Island has been set aside by the government for a bird laboratory. Over 220 species of birds have been found, and much primeval fauna, which covers a large part of the island, was brought back by Dr. Frank Chapman, curator of the department of birds at the museum, Francis L. Jacques, artist, and Raymond L. Potter, taxidermist.

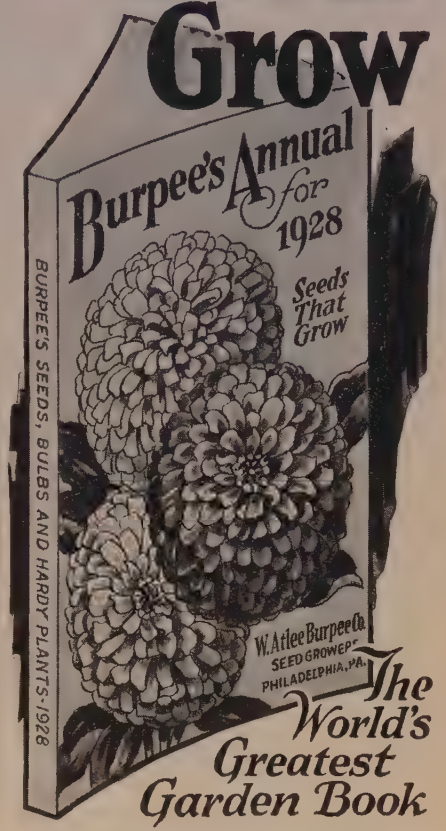
National Forest Gains

Additions to the area of our National Forests totalled 41,214 acres during the past fiscal year, according to announcement from the United States Forest Service. The growth was smaller than in previous years due to the transfer of considerable lands to National Park status. The National Forests now number 160 in 32 states, Alaska and Porto Rico. It is also interesting to note in this connection that the first quarter of the current fiscal year beginning with July, brought an increase in the total receipts of the National Forests over the corresponding period of last year of $110,091.

Plant Progress Made

The nation has greater possibilities than ever of becoming self-sufficient in agricultural production, according to the annual report of William A. Taylor, chief of the Bureau of Plant Industry of the United States Department of Agriculture. Tests in rubber production carried on in Florida, California and Haiti, have succeeded in determining in large measure the species best adapted to American climate, and further results are expected. A domestic supply of Japanese mint, supplying menthol, is possible, and "money crops" of santonin, an important vermifuge, may soon be raised in California and northeastern Oregon, the bureau predicts. Another product whose domestic supply may soon equal the demand is abaca, from which Manila hemp is made.

Burpee's Seeds Grow



The World's Greatest Garden Book

You will find "Burpee's" an interesting book chock full of information about the super quality Vegetables and Flowers you would like to see growing in your garden.

New Vegetables and Flowers

Burpee's Branching Sweet Corn—an outstanding distinct new variety with as many as six ears to a plant. Four excellent new Sweet Peas—one of them named **"Fluffy Ruffles,"** representing the first of the "ruffled" type, and a number of new **Giant Gold Medal Dahlias,** the last word in this popular flower.

Burpee's Annual is Free

It tells the plain truth about the Best Seeds That Grow. A complete garden guide offering the best in Vegetable Seeds, Flower Seeds, Lawn Grass, Farm Seeds, Bulbs, Roots, Fruit Trees, Flowering Shrubs, and Roses. Just mail a postcard or the coupon below and Burpee's Annual will come to you free.

TEAR HERE

W. ATLEE BURPEE CO.
SEED GROWERS **PHILADELPHIA**

Gentlemen: Send me a **free** copy of Burpee's Annual. 65

Name.....

R. D. or St.....

P. O.....State.....

8 POWER $9.85
DAY AND NIGHT LENSES
LIFETIME SERVICE

A powerful and accurate precision instrument at an unusually low price.

GERMAN FIELD GLASSES
A World Famous SA Product

Many thousands of lovers of the great outdoors use and swear by this popular Field Glass.
Objects 10 to 20 miles away appear 8 times nearer. Experienced sportsmen say "next to a good gun—the most essential part of the hunter's equipment."
Made according to strict specifications of military engineers. Sold by sporting goods, optical, and camera supply stores in the U. S. A. and Canada, or sent postpaid on receipt of check, money order or C. O. D. The S & A guarantee means full cash refund if not satisfactory.
Our expert repair department will submit estimates on glasses sent in for repairs.
SWIFT & ANDERSON, Inc.
Largest Importers of Field Glasses in America
97 W. Federal St. BOSTON, MASS. 23M. Scott St. TORONTO, CANADA
Sole Distributors for HENSOLDT PRODUCTS
HENSOLDT catalog showing improved DIALYT PRISM BINOCULARS sent on request

Mount Birds
Learn at Home by Mail

Be a taxidermist. Learn to mount BIRDS, ANIMALS, GAME HEADS, FISH. Wonderful fascinating new art. All secrets revealed. Easily, quickly learned by men, women and boys. Decorate home and den with nature's finest art. SPORTSMEN save your trophies. BIG PROFITS for spare time. Sell your mounted specimens and mount for others. Have a business of your own. Big demand, high prices. Learn from old reliable school, 20 years' experience.

FREE! Beautiful illustrated book, "How to Learn to Mount Game", with dozens of photos of mounted specimens. Yours for the asking — FREE — Write Today. Taxidermy is a NECESSITY for sportsmen and nature lovers — INVESTIGATE. Get this wonderful FREE BOOK NOW — no obligations. Write! Don't delay. Send Coupon Today—NOW!

N. W. School of Taxidermy
2942 Elwood Bldg., Omaha, Neb.
Send me your free illustrated book "How to Mount Game." Also tell me how I may learn this fascinating art easily and quickly by mail. No obligation.
FREE BOOK COUPON
Name .....
Address .....

Make Money in Photography!

We train you quickly at home. No experience necessary. Spare time or full time. Photographs in big demand by magazines, newspapers, advertisers, etc. Portrait Photographers make more money today than ever before. Commercial Photography also pays big money. New plan. Nothing else like it. Write today for details and new FREE book, *Opportunities in Modern Photography.*
American School of Photography
Dept. 1602 3601 Michigan Ave., Chicago, Ill.

See Miles Away! with Big 3½ Ft. Telescope
5 DAY TRIAL
5 Sections 8 Power

Brings distant people and objects close to your eyes. Wonder telescope opens over 3½ ft. long, 5 big sections, brass bound, 8-power lenses. Ideal for sports, camping, travel.
Read numbers on freight car mile away.—A. C. Palmer.
FREE CARRYING CASE AND SHOULDER STRAP
SEND NO MONEY
On arrival pay postman $1.85, plus postage (2 for $3.50). Or send $1.85 and we pay postage. Try 5 days. Money refunded if not delighted. Send today.
FERRY & CO., DEPT. 1451 CHICAGO, U. S. A.

Photographic Department

(Continued from page 75)

LOCAL REDUCTION

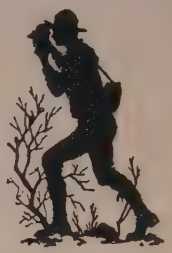
Very frequently one makes a negative in which there occur one or more dense spots, or spaces, that will print out too white. Local reduction will always rectify this. I have found that the very best reducing agent for this work is a solution of ferricyanide of potassium and hypo. If the plate to be reduced has just been taken from the fixing solution a plain solution of the ferricyanide is all that is necessary for the plate already holds enough hypo. The work should be done with great care with a camel's hair brush in cases of small spots and a wad of cotton on broad spaces such as skies. The action of this reducer is sometimes very rapid and so a weak solution should be used. There is no need of a formula simply use the ordinary strength hypo to which add ferricyanide until it becomes a pale lemon yellow. A tray of clear water should be at hand with which to frequently rinse the negative. If you have never done any of this work it will be a wise plan to practise on an old discarded negative until you acquire the proper technique before risking a negative that may be of value.

Owners of home motion picture projectors will be interested to learn of twelve new releases in the Ditmars "Living Natural History Series" by the Bell and Howell Company, Chicago. Full details of these new films, which bring the total of the Ditmars series to thirty-six, can be obtained from the company, or by writing to this department.

A home movie projector that threads itself automatically, arrests the motion on the screen to a still view at the twist of a lever, runs scenes backwards at another twist, rewinds the film by motor at twelve times speed, and then folds up into a space 10¼ by 9 by 7½ inches has been announced by the Eastman Kodak Company after months of testing.

A new projector for the 16mm film has been announced by the DeVry Corporation. It is a lightweight machine, weighing seven pounds, but has a 200 watt lamp with special reflector and an F2.-50mm lens. It is equipped with a motor for either A.C. or D.C. current. The DeVry Corporation also maintains a film library, lists of films available being sent on request.

AMATEUR MOVIE MAKERS BRING ALL OUTDOORS HOME ON THEIR FILMS.



CINEMA AMATEURS HAVE CREATED THE AMATEUR CINEMA LEAGUE TO SERVE THIS HOBBY WHICH PRESERVES ALL THEIR OTHER HOBBIES.

LEAGUE DATA AND A SAMPLE COPY OF AMATEUR MOVIE MAKERS WILL GLADLY BE SENT TO YOU ON REQUEST.

AMATEUR CINEMA LEAGUE
(A Non-Commercial Organization)
105 W. 40th St., New York, N.Y.

SPECIAL- Holiday Sale !

MIRAKEL
VEST POCKET BINOCULARS
5-POWER · $19.85
(7-POWER : $35)
USED BY—Frank Chapman, R. Bruce Horsfall, Arthur Newton Pack, Ernest Thompson Seton, Vilhjalmur Stefansson, etc.
Seeing is Believing
MIRAKEL DISTRIBUTORS
1214 16th St. Washington, D. C.

Here's Your Next Summer's Camp
Travel Where You Please!
Take a high-speed ZAGELMEYER AUTO CAMP TRAILER with you this year on your camping trip. Attaches to any make of car. Travels easily at any speed. Carries all luggage. Requires no unpacking. Just raise the canvas cover and your sleeping quarters are ready—rainproof and mosquito proof—beds off the ground. All the luxuries of home—electric light, kitchenette, ice box tables, etc. Extra tent and canopy easily attached if needed for large camping party.
SPECIAL PRICES NOW!
Send for FREE CATALOG of Trailers and Kamper-Kars now offered at special low prices for a limited time.
ZAGELMEYER AUTO CAMP CO.
1502 S. Henry St.,
Bay City, Mich.
FREE BOOK

Nature Study Camp

THE PENNSYLVANIA STATE COLLEGE

In the heart of Pennsylvania's Beautiful Mountains

Three weeks of Intensive Field Work

Lectures by Anna Botsford Comstock, R. F. Ganier, Dr. John Hollinger, and other Authorities

For announcement address

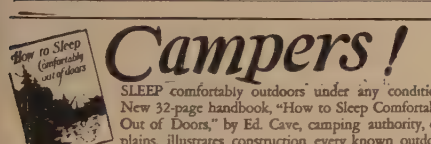
Professor Geo. R. Green, State College, Pa.

CAMP INFORMATION

FREE Catalogs of all Boarding Schools (*or camps*) in U. S. Advice. Want for Girls or Boys? No fees.

AMERICAN SCHOOLS ASSOCIATION

Write 1211-N Times Bldg., N. Y. or 1204-N Stevens Bldg. Chicago



Campers!

SLEEP comfortably outdoors under any condition. New 32-page handbook, "How to Sleep Comfortably Out of Doors," by Ed. Cave, camping authority, explains, illustrates construction every known outdoor bed—bough, auto, camp beds. A score of ideas that will double the pleasure of your next trip. SEND 10 CENTS TODAY

HODGMAN RUBBER COMPANY, 641 Tripp Street, Framingham, Mass.

A Book of Fishes

Ida Mellen of the New York Aquarium has a speaking acquaintance with a number of fishes that compares favorably with the number of constituents known to some of our more popular politicians. She seems to know their language, if such there be, and certainly knows their habits and problems. Who might one better select, then, to write *The Young Folks' Book of Fishes* published by Dodd, Mead and Company of New York. The fishes that swim in the sea, strange and common, are a fascinating study and Miss Mellen in her book has made this study doubly interesting. The volume sells for two dollars.

Nature Study Course

The schools of Sacramento are this year following a new course in Nature Study. This has been recently issued in mimeograph form and is closely associated with the work in health education.

The material includes in addition to a summary of the objectives in science teaching given in the Fourth Yearbook of the department of Superintendence of the National Education Association an abstract of the work for each of the first six grades. In this plan more than enough material is suggested for each grade. The work for individual grades is not limited to a consideration of any particular group of organisms. Neither does there seem to be any particular theme developed for consideration in the individual grades. There is ample opportunity for adapting the program to conditions where grades would be grouped though no actual grouping is suggested. Comparatively little suggestion is made for studying things in their relation to each other and the only correlations emphasized are those with health education and geography.

The detailed suggestions are generally excellent, the development of the work of the state fish and game conservation activities being particularly creditable. This section of the outline seems to be more purposeful

Young men needed *by*

Davey Tree Expert Co.

Interesting, vigorous outdoor work in a growing organization where merit wins advancement. Good starting wages. Permanent positions and a real future for men who make good. Our present field force of Davey Tree Experts cannot meet the increasing demand. So we are selecting now, to enter our employ, a few sturdy, clean young men, thorough Americans, single, between 20 and 30 years old, free to travel, industrious, with good practical education, and able to give good references. Write for qualification blank to serve in place of personal interview. The Davey Tree Expert Co., Inc., 891 Federal Bldg., Kent, Ohio.

CANADA TAX SALE

Buy These Bargains by Mail

Pay in Monthly payments $5 or $10

$49.50 for 2 acres lake front
$63.00 for 25 acres on road
$180.00 for 100 acres with creek
$112.50 for 1000 yards river frontage
$450.00 for 300 acres game preserve
$67.50 for 5 acres on Georgian Bay
$171.00 for 79 acres Ocean front

THESE are a few items taken at random from our new twenty page illustrated booklet of Canadian properties seized and sold for taxes, which is free for the asking. Beautifully situated hunting camps and fishing lodges where there is real hunting and fishing, summer cottage sites, islands, heavily wooded acreages situated in Muskoka, Highlands of Ontario and the New North. Also farms in old Ontario, Quebec, The Prairie Provinces and British Columbia. You couldn't buy these for ten times the price in the ordinary way. Now is the time to invest in Canada's future—minerals, forests and farms. Don't delay. Send no money but send for the booklet to-day so you will have first choice. Full particulars.

TAX SALE SERVICE
Room 613, 72 Queen Street West
Toronto 2, Canada

AMERICAN NATURE ASSOCIATION,
1214 Sixteenth St. N. W.,
Washington, D. C.

I desire membership in the American Nature Association, including NATURE MAGAZINE each month, and such bulletins and information as are given to members. I will remit $3.00 for one year's dues upon receipt of your bill.

90% of the annual dues is designated for subscription to the magazine

Name .....

Street .....

City .....

February

AMERICAN NATURE ASSOCIATION,
1214 Sixteenth St. N. W.,
Washington, D. C.

I enclose $3.00 for membership in the American Nature Association for one year, including NATURE MAGAZINE each month, and such bulletins and information as are given to members.

90% of the annual dues is designated for subscription to the magazine

Name .....

Street .....

City .....

February

Audubon Bird Charts

Twenty-six Common Birds
(In Color)

Drawn by EDWARD KNOBEL
under the direction of RALPH HOFFMANN

The Birds pictured are as follows:

Red-winged Blackbird	Golden-crowned Kinglet
Bluebird	Robin
Bobolink	Chipping Sparrow
Catbird	Song Sparrow
Cedar Bird	Barn Swallow
Chickadee	Chimney Swift
Purple Finch	Scarlet Tanager
Flicker	Wood Thrush
Goldfinch	Red-eyed Vireo
Ruby-throated Humming-Bird	Black and White Warbler
Blue Jay	Yellow Warbler
Kingbird	Downy Woodpecker
Baltimore Oriole	House Wren

Interesting-Instructive

Awaken the interest of children in our common birds with these charts depicting the natural colored, life-sized birds in their characteristic attitudes. They are practical and helpful in all nature study and drawing.

Lithographed and mounted on cloth. Size 27 x 42 inches

For
Home Schoolroom Library

Four Beautiful Charts

Price $2.50 Each

AUDUBON BIRD CHARTS
1214 Sixteenth Street
Washington, D. C.

than many of the other sections. The biological aspects of Nature are emphasized more than the inorganic phases. The outline is ambitious in its detail and as it is only tentative will probably develop into a valuable plan for consideration of communities such as Sacramento.

Flora of Chicago

The botanist and the student will certainly welcome *Flora of the Chicago Area* by H. S. Pepoon, brought out as Bulletin Number Seven of the Chicago Academy of Sciences. "Bulletin" hardly describes this volume, which comprises 554 pages, interspersed with fine illustrations. It is an annotated and carefully compiled and indexed work representing tremendous labor and constituting a distinct contribution to botanical literature. The treatment is technical aside from the first hundred or so pages of descriptive and geographical data. This volume is sold by the Chicago Academy of Sciences, Clark and Center Streets, Chicago, and the price is $3.50.

Boy Scout Handbook

The new Handbook for boys of the Boy Scouts of America is a notable contribution to popular Nature literature. Of the 614 pages, 170 may be legitimately considered as devoted exclusively to Nature Study. Most notable probably is the section dealing with tree study, where some 126 species are treated. Pictures of the trunk, twigs, fruits, leaves, general form and a distribution map are given for each of the species. It would seem that the present handbook would enjoy and deserve even greater popular approval than was accorded the earlier handbooks. It should be understood that the present book is a complete revision of the earlier books.

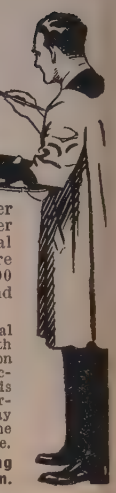
On Photomicrography

In the light of recent improvements and discoveries in the field of microscopic photography and the increasing importance that it has in technology and industry, the new and revised edition of the *Handbook of Photomicrography* by H. Lloyd Hind and W. Brough Randles is both timely and useful. The bringing out of the new edition has enabled the authors to rewrite certain parts of the book to bring them up to date and to add a number of pertinent and valuable illustrations, several of them in color. The volume is published by E. P. Dutton and Company and is listed at five dollars.

We and the World

The teaching of geography appears to have changed from the days when we learned to bound this country and that province and otherwise to use the unwieldy textbook as a convenient screen. A case in point is *We and the World* by William C. Redfield, former Secretary of Commerce, published by Silver Burdett and Company. This volume, primarily designed as a school text, is a combined commercial geography and geographical story of a number of Nature's gifts to our comfort, convenience and tastes. It treats simply and interestingly with many products that other countries of the world supply to us and in so doing paints a picture of these countries as well. This is entertaining geography.

make money DRAWING

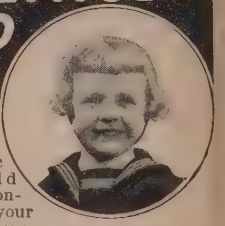


If you have natural ability to draw—which only a limited number possess—develop it through proper training for a career as a Commercial Artist. Many Federal Students are earning $3500, $4000, $5000, and $6000 —some as high as $10,000 and $12,000 yearly.

The **right training** can save you several years' time, and bring you quickly to a worth while income. The Federal School has won a reputation as "the School famous for successful students." The Federal Course is practical from A to Z, and gives you personal criticisms on your lessons. Send today for book "YOUR FUTURE" giving all the facts about this fascinating home-study course.

Federal School of Commercial Designing
1909 Federal Schools Bldg. Minneapolis, Minn.

NEW METHODS IN CHILD TRAINING



Now for the first time—a scientific method in child training, based on confidence, shows you in your own home how to correct *cause* of disobedience, untruthfulness and other dangerous habits, which, if not properly remedied, lead to serious consequences. New method makes punishment unnecessary and is producing remarkable results for thousands of parents. Endorsed by leading educators. Covers all ages. **Free Book,** "New Methods in Child Training," describes new system. Write for your copy now. **Parents Association, Dept. 1232, Pleasant Hill, Ohio.**

YOU CAN OIL PAINT

Amazing new method teaches men or women to earn after first lesson. OIL PAINT photos at home—portraits, landscapes or art subjects. Many earn $18 to $100 and more a week. OIL PAINT OUTFIT GIVEN at No EXTRA COST. Graduates furnished employment. Send now for free illustrated book.

PICTORIAL ART STUDIOS, INC.
Dept. I. S. 2926 Broadway, Chicago, Ill.

HIGH SCHOOL EDUCATION at HOME — Only $15.85

Fascinating question and answer method. Used in High Schools. Every subject covered. Easy terms. Certificate awarded. Write for free folder.
HIGH SCHOOL HOME STUDY BUREAU, Inc.,
(Dept. 862) 31 Union Square New York City

Learn Advertising at HOME

Send your name and address for free booklet giving interesting information and vital facts about Advertising. Find out how we prepare you at home, in your spare time, for the opportunities open in this fascinating business. Practical work. No text books. Old established school. Successful graduates everywhere. Just the plan you have always wanted. Write today. No obligation.

PAGE-DAVIS SCHOOL OF ADVERTISING
Dept. 1602, 3601 Michigan Ave., Chicago, U. S. A.

EARN PROMOTION AND COLLEGE CREDIT
through the
HOME-STUDY COURSES
in 40 different subjects given by
The University of Chicago
201 Ellis Hall, University of Chicago, Chicago, Ill.

WANT WORK AT HOME?

Earn $20 to $50 a week RETOUCHING photos—men or women. No selling or canvassing. We teach you at home, furnish WORKING OUTFIT and employment service. Write today.
ARTCRAFT STUDIOS, Dept. C
3900 Sheridan Rd. Chicago

BEAUTIFUL POTTERY
BIRD BATH
$ 9.00
31¼ IN. HIGH OVER ALL

GAZING GLOBE
$ 21.00
PEDESTAL 25 IN. HIGH-GLOBE 14 IN. DIA.

BIRD FEEDER
WREN HOUSE
SUET
TOP RAISES TO FILL
FEEDS AUTOMATIC
$1.00 WITH BRACKET
$2.50
FREE
BIRD FEED WITH EVERY FEEDER.
SEND FOR LITERATURE.

RODERICK PAYNE CO.
"THE BIRD HOUSE MAN"
SPRINGFIELD OHIO

BIRD FILLING STATIONS
Patented July 13, 1926

Feed the birds NOW and help them through the winter.

AUTOMATIC
Suet always clean and accessible to last particle.

No. 1, price $1.50
No. 1 to hang from tree or bracket.

For smallest home or largest estate. Every home should have several.
Postage Paid in U. S.

No. 2, price $1.25
For window casings, porch columns, etc.

LEWIS P. KELLY, R. F. D. 4, Dept. N, Peoria, Ill.

FEED the BIRDS

Use the **Packard Automatic Feeder.**

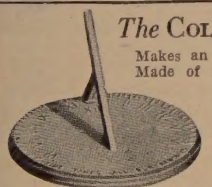
Keeps food dry, avoids waste, holds a quart, weighs (packed) 3 pounds, and costs $1 and **postage. Why pay more?**

Special Mixture Bird Food

Balanced ration. Nothing else like it: nothing else so good. 10 pounds, $2 and postage.

Everything For Wild Birds
Catalogue Free

WINTHROP PACKARD
1433 Washington Street Canton, Mass.



The COLONIAL *Sun Dial*

Makes an ideal Garden ornament. Made of cast metal; diam. 11"; weight 8 lbs. Lacquered a rustic gray and gold. Motto— *"Time takes all but memories."* Postpaid $3.50, or $4. west of Denver.

Also terra cotta sun dial pedestals, hand-made pottery, undecorated castings for book ends, door stops, lamp bases. Write for prices and illustrations.

CRAFT DEPT.
A. H. PATCH, INC.
Est. 1885
Clarksville, Tenn.

TWO FREE BOOKS

Breed squabs and make money. Sold by millions at higher prices than chickens. Write at once for two free books telling how to do it. One is 40 pages printed in colors, other 32 pages. Ask for books three and four. You will be surprised. Plymouth Rock Squab Company, 704 H Street, Melrose Highlands, Massachusetts. Established 26 years.

Questions and Answers

The American Nature Association will be glad to answer each month such questions as its members ask about Nature

QUESTION: *I am interested in the conservation of game. Could you tell me something about the probable future of game in this country fifty years hence?—R. R. L., Jr.*

ANSWER: Briefly, the outlook for game fifty years from now is not encouraging. Though there are many men and many organizations that profess to be interested in game conservation, far too few are advocating the one effective remedy—less killing. The quail, wild turkey, ruffed grouse and other species you mention are becoming steadily scarcer. The truth is that those interested in killing and in *implements of destruction* are far more numerous and powerful, that is —better organized, than those truly interested in wild life conservation.

QUESTION: *What should I feed three mud turtles that I have hatched?—I. S.O.*

ANSWER: Most water-inhabiting turtles will eat strips of fish or meat, and occasionally a piece of lettuce. Insects of most kinds are also relished.

QUESTION: *Has frost anything to do with the riot of color in foliage in autumn? —L. E. D.*

ANSWER: Frost has very little to do with the autumn coloring of leaves. The colors are caused by changes in the chlorophyll grains and other constituents of the leaf when the proteid material has been withdrawn to be stored for later use. Frost may at times hasten the process, but in years of late frost much of the coloring will take place before it comes. During the past season, for example, over much of our middle states, the coloring preceded the frost.

QUESTION: *Do house plants thrive in flower pots that have been painted or enameled?—E. F.*

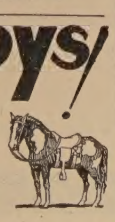
ANSWER: While in some cases house plants will thrive in enameled pots, it is usually advisable to use those made of porous ware, as these allow the roots a certain amount of ventilation, a condition most favorable for growth.

QUESTION: *Do horned toads spit blood out of their eyes, and, if so, is it for protection?—A. C.*

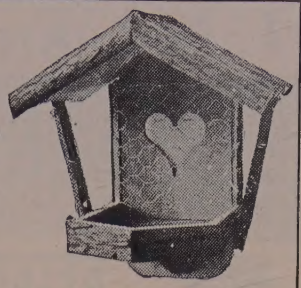
ANSWER: It is a well-established fact that our horned lizards eject blood from their eyes. The action results from the engorgement of the blood capillaries under the influence of fear or anger. These sometimes burst and the blood is sprayed for a little distance. The blood is, of course, not poisonous, but the action is supposed to be protective.

FREE to BOYS!

Sample copy of OPEN ROAD for BOYS Magazine—50 pages of thrilling stories, pictures, sports, mystery, etc. Also free membership in the WINNIT CLUB—badge button, big outfit, catalog and brand-new plan for making lots of easy money and swell prizes. ALL FREE! Pony and bicycle given too. No obligation.
Send name and address at once to
WINNIT CLUB :: *Open Road for Boys*
248 BOYLSTON STREET, 71 BOSTON, MASS.



The Ever Popular CEDAR Bird Houses



Have a Heart Feeder No. 65
$2.60 each or 2 for $5.00
Unique Gray Squirrel House $6.00

Bluebird, Robin and Wren,
3 for $5.00 and Parcel Post charges.

CRESCENT COMPANY
"Birdville" Toms River, N. J.

Exceptional Specimens of Wild Life

Collectors of the beautiful in nature should send for Jonas Bros. Superb Art Catalog (FREE) which shows exceptional specimens of wild life mountings and reveals the fine art and scientific points of modern taxidermy.

Jonas Bros.
1023 Broadway, Denver, Colo.

Attract Wild Ducks
Fish—Fur-Bearers!

Plant Wild Rice, Wild Celery, Duck's Meat, etc., highly recommended by U. S. Government. 40 other foods. Liberal discount on orders placed during winter. Spring delivery. 32 years' experience. Write today for free helpful planting information.

TERRELL'S AQUATIC FARM
16 N. Blk. Oshkosh, Wisconsin

BECOME A LANDSCAPE ARCHITECT

Dignified, exclusive profession. Little competition. $5,000 to $10,000 incomes for experts. Easy to master under our correspondence methods. Assistance extended to students and graduates. Write today for full details.

American Landscape School, 83, Newark, New York

Butterfly Shades

All materials and directions for making this Exquisite Shade — 12" $5.00

Price complete $12.50
BUTTERFLY BOX
70 Franklin St., BOSTON, MASS.

Send for Circular showing complete line

EARN $25 WEEKLY SPARE TIME — This Book FREE!

Write short stories and news items for magazines and newspapers. Experience unnecessary. Write today for FREE details and valuable copyright book.

How To Write for Pay

PRESS INSTITUTE, 1268 ST. LOUIS, MO.

THIS CLASS PIN 30c.

12 or more, Silver plate, Single pins 40c ea. choice 2 colors enamel, 3 letters, date. Sterling Silver, 12 or more 50c ea. Single pins 60c. ea. Free Cat. shows Pins, Rings, Emblems 25c to $8 ea.

685 METAL ARTS CO., Inc., 777 Portland Ave., Rochester, N.Y.

IN THE KENNELS

DELCREO
DOG REMEDIES
Recommended by the leading breeders and fanciers.
Free Kennel Manual
How to care for your dog
Dept. 52 The Delson Chemical Co.
42 Penn St., Brooklyn, N. Y.

MILLER'S A-1 DOG FOODS

KEEP 'EM FIT
"The Pink of Condition"—that valuable new dog book contains expert advice on care and feeding. Send ten cents today for your copy and sample of food.
Battle Creek Dog Food Company
282 State Street, Battle Creek, Michigan

Man! how they like it! KEN-L-RATION is a scientifically balanced ration of meat, cereals and cod liver oil. Comes in cans ready to serve.
For sale by grocers, druggists, pet shops, sport goods and feed stores, etc. Write us for FREE sample can.
CHAPPEL BROS. INC.
1110 Peoples Ave. Rockford, Ill.
KEN-L-RATION
THE DOG FOOD SUPREME

SCOTTISH TERRIERS
Beautiful young stock now ready for delivery. Price reasonable.
Loganbrae Kennels
Rutland, Vt.

DALMATIANS
Guard home and automobile, with a Coach dog. Choice puppies for sale—Price reasonable.
REGAL DALMATIAN KENNELS
Nevada, Ohio

COCKER SPANIELS
Several high class Cocker Spaniel females for sale, ranging in age from five to eight months. Sired by Ch. Midkiff Miracle Man and Merryfield Wildfire. Solid red, black and parti-colors. $25.00 to $50.00 each. Eligible to register. Also males $60.00 to $125.00.
MERRYFIELD KENNELS
R. F. D. No.1 Scotch Plains, N. J.

SALE OF PUPS
Pedigreed Police $25 Airedales $20
All Males
MAPLEWOOD KENNELS
Box 27 MEDWAY, MASS.

WHITE COLLIE PUPS
The most beautiful specimens the dog world can offer. Home guards, loyal companions, useful and intelligent. Illustrated circulars free.
COMRADE FARMS
Galion Ohio

IRISH TERRIERS
Puppies and grown stock sired by Ch. Kilvara Statesman—Ch. Harlem Banker—Ch. Irish Rival.
Prices from $35 up, according to age, sex and quality
SASSY KENNELS
204 E. Genesee St. Fayetteville, N. Y.
Member Irish Terrier Club of America

Newfoundland Puppies
Ready to ship out at $25. to $40. each. The nicest I ever raised. Big growthy fellows. Breeding stock registered in both the A. K. C. and U. K. C.
A. F. SIEFKER
DEFIANCE MISSOURI

RAVENWOOD KENNELS
Boston Terrier Puppies
If you are interested in fine young stock—two to six months old—male or female, I am sure that I have a puppy that will please you. They are bred in the purple from the best pedigreed stock obtainable; all have fine blocky heads, good conformation, and are very promising. Guaranteed to please. Safe shipment anywhere in the United States or Canada.
MAURICE W. POWERS
2404 East Fayette St., Syracuse, N. Y.

Membership Nomination Blank

AMERICAN NATURE ASSOCIATION *WASHINGTON, D. C.*

ANNUAL DUES	
United States	$3.00 a year
Canada	$3.25 a year
Abroad	$4.00 a year

....., 1928

Secretary, AMERICAN NATURE ASSOCIATION,
1214 16th St., Washington, D. C.

I nominate for subscribing membership in the Association and to receive NATURE MAGAZINE:

.....

Address.....

.....

Name and address of
Nominating Member.....

.....

90% of the annual dues is designated for subscription to the magazine

Forestery Education Marching On

Juniors Using Forestry Primers and Being Guided in Planting Programs

THE CARTOON WINNERS

CARTOONS are the good right arm of education in forestry. Further to inspire such work the American Tree Association announces the winners of its National Forestry Cartoon Contest as follows;

1. SAM E. NASH, Jr., Tyler, Texas.....$250.
2. FLOYD GOTTFREDSON, Richfield, Utah $100.
3. RICHARD W. TUPPER, Washington, D.C. $50.
4. JAMES T. SHAFFER, Lancaster, N. Y..$25.
5. F. D. MILLER, Denver, Colo.....$25.
6. BRUCE RUSSELL, Sierra Madre, Calif...$25.
7. WILLIAM L. ADDKISON, Jackson, Miss. $25.

THE JUDGES were; Mrs. Mary K. Sherman, President of the General Federation of Women's Clubs; John Hays Hammond; J. N. Darling (Ding), noted cartoonist; Col. William B. Greeley, Chief of the United States Forest Service; Dr. John T. Finley of the New York *Times*.

The winning cartoons will be printed from time to time in Nature Magazine. There were 210 cartoons received.

AT Jackson more than one hundred posters submitted in the poster contest put on by the Mississippi Forest Service now hang in the Woman's Club Building, reports D. Priscilla Edgerton, State Supervisor of Forestry Education. The nine prize winners carry the blue and red ribbon badges of first and second award. The three honorable mentions are marked by yellow ribbons. The awards of the committee of judges were as follows: *General* First, Mrs. Emmett Hull, Jackson; Second, Mrs. Childress Armstrong, Jackson; Honorable mention, Miss Victoria Trolio, Canton. *High School* First, Lalla W. Lewis, Greenwood; Second, James Lundy, Greenwood; Honorable mention, Bonita Lundy, Greenwood. *Elementary* First, Pat Kelly, Laurel; Second, Marjorie Stainton, Laurel; Honorable mention, Mildred Mulligan, Laurel.

Representatives of the Mississippi Art Association, the State Department of Education, and the United States Forest Service, based their awards on originality, forcefulness of design, and color and lines of the illustration, combined with concise wording of the slogan. A few of the slogans are: Why Destroy a Friend? The Guardian Spirit of the Forest is the Public Sentiment. The Fifth Horseman. Our Flag Stands Behind Our Forests. Let Your Trees Grow; They Mean Money. Beauty and Wealth are Found in Trees. Leave Mother Trees on Cutover Land.

What a wonderful thing it would be if every school could have a school forest. In New York State school forests are not taxed, says the New York State College of Forestry at Syracuse University. This encouraging provision of the law should result in the establishment of many more school forests although there were 238,000 trees planted on school forests in 1926. All property of school districts is exempt from taxation, which includes any forest land that the school district may own or acquire. This exemption applies to state, county and local taxes. School forests are built up gradually from year to year. Some schools plant as few as one thousand trees annually and others set out young trees in much larger numbers.

The school forest if established on a sufficiently large scale will eventually yield enough to meet the expenses of the school if the forest is kept under proper management. One hundred fifty acres of mature white pine ought to yield at least 600 board feet of lumber per acre annually. If the stumpage value was $15 a thousand such a tract would produce a yearly income of $1350.

In Europe sufficient revenues are obtained from some forests to pay municipal taxes and there is no reason why many school districts in this country could not meet all expenses for education through revenues obtained from planted forests managed on a sustained yield basis. The school forest has a big advantage over other forests inasmuch as the two largest items of expense in reforestation, labor and taxes are eliminated; the school children usually plant the trees on Arbor Day or Saturday. With these items of cost disposed of there can be no question about profitable returns. Such forests, in fact, should be the most profitable of all. In addition to this the school forest is an ideal place to study.

The silver loving cup offered as a prize to the Club of New York sportsmen planting the greatest number of forest trees during the year has been awarded to the Shawangunk Fish & Game Association of Orange and Sullivan Counties. The cup was presented during the annual session of the New York State Fish, Game & Forest League which has just concluded in Syracuse.

The cup is given by James S. Whipple, former Commissioner of the State Conservation Commission for the purpose of stimulating interest in the reforestation of idle and waste land in the State. The Shawangunk Fish & Game Association, Middletown, N. Y. surpassed all other clubs in planting or causing to be planted some 603,000 trees. The Cortland County Sportsmen Association ranked second with 406,000 trees. The Orange Lake Fish & Game Association, Newburg, N. Y. was third with 46,000.

Among the leaders were: The Chemung County Rod & Gun Club, 20,000; East Herkimer Fish & Game Club, 14,000; New Berlin Fish & Game Club, 8,000; and Sherrill Rod, Gun & Conservation Club, 6,000.

Reforestation of northern Wisconsin is being taken up by the younger generation. Wisconsin's timber is practically all gone. There is little virgin timber left in the state for commercial purposes. What does remain is being used for recreational and resort purposes.

It is the intention of A. J. Brann, Oneida County agricultural agent, to have junior foresters kill two birds with one stone. His plan, agreed to by members of the Oneida County board, is to organize throughout the county Junior Forestry clubs, boys from 14 to 20 years of age, pledged "to help restore and to enjoy and to pass on to posterity our state, more beautiful, enjoyable and provident than it was passed on to us." The boys are to plant 10 acres of white pine and Norway pine seedings on tax delinquent land, each selecting a 40-acre tract. Upon completion of the 10-acre planting, the county for a nominal sum, perhaps $1 would deed the entire 40 acres to the junior forester. To assure continued interest in the plat, however, the county will require future plantings, at the rate of 10 acres each year until the tract is in the process of becoming a pine forest.

The plan has been heartily endorsed by R. E. Turner, of the forestry division of the United States department of agriculture, who declared that the movement is "unique and has wonderful possibilities." K. L. Hatch, head of the Wisconsin extension department, college of agriculture, likewise is highly enthusiastic. More than 150 Oneida boys have been enrolled.

These educational programs go hand in hand with the distribution of the Forestry Primer by the American Tree Association. The distribution has now reached 1,600,000, the sixteenth printing of 100,000 having just come from the press. They are being used in project work and plans now being made in anticipation of American Forest Week in April. Any school teacher can have a copy by writing for one.

First grade children are studying trees in Ida Grove, Iowa. Miss Grace Jones of the Ida Grove schools devised a program of free study for primary pupils that included lessons for fall, winter, and the spring planting season, visits to the woods, and the preparation of a window exhibit for American Forest Week. The children made tree books with pressed leaves and kodak pictures, identified local species by shape and bark, heard something about the uses of certain kinds of wood, and learned what kinds of trees are desirable for street and lawn planting in their town. With the tree lessons were correlated lessons in music and art appreciation. In the American Forest Week exhibit which the children helped their teacher to prepare, twigs of different trees were arranged together with charts showing the leaf, bark, seed, and bud of each, samples of the wood, with kodak pictures of the trees. In the background were reproductions of paintings by Corot.

At Central City, Pa., school children celebrated Arbor Day by planting 70,000 trees on the watershed of the vicinity. Added to plantings of three former years, this brings the total to 259,000.

HENDERSON'S

SPECIAL OFFER

1928 Seed Catalogue and 25 cent Rebate Slip—only 10c

Giant Waved Spencer Sweet Peas

Henderson's Invincible Asters

Brilliant Mixture Poppies

MAIL the coupon with only 10 cents, and we will mail you "Everything for the Garden," Henderson's new seed catalogue, together with the new Henderson 25 cent rebate slip, which will also entitle you, without charge, to the Henderson specialty offer of 6 packets of our tested seeds with your order.

These 6 packets are all seeds of our own introductions, and are among our most famous specialties—Ponderosa Tomato, Big Boston Lettuce, Early Scarlet Turnip Radish;—Invincible Asters, Brilliant Mixture Poppies and Giant Waved Spencer Sweet Peas. These, like all Henderson's Seeds, are tested seeds.

For 81 years, HENDERSON'S TESTED SEEDS have been the standard. Year after year, our constantly improving methods have enabled us to maintain our supremacy among American seed houses. The initial cost of your seeds is the smallest item in your garden's expense, and it is of advantage to plant seeds of recognized quality from a house of reputation and standing.

Every Rebate Slip Counts as Cash

With every catalogue will be sent our Henderson Rebate Slip which, returned to us, will be accepted as 25 cents cash payment on any order of two dollars or over.

In addition we will include with your order, without charge, the Henderson specialty collection of three packets of vegetable and three packets of flower seeds as described above.

Everything for the Garden

This is a book of 204 pages, with 12 beautiful color plates, 128 pages of rotogravure in various colors, and over a thousand illustrations direct from actual photographs of the results from Henderson's seeds.

It offers many special collections of vegetable seeds arranged so as to give a continuous supply of fresh vegetables throughout the Summer, and collections of flower seeds especially arranged for harmony of color and continuity of bloom.

It is a complete garden book, and should be in the hands of every lover of the garden beautiful or bountiful—Clip the coupon now!

PETER HENDERSON & CO.
35-37 Cortlandt Street
New York City

Early Scarlet Turnip Radish

PETER HENDERSON & CO.
35-37 CORTLANDT STREET
NEW YORK CITY

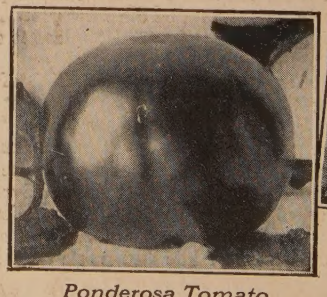
Enclosed is 10c for Henderson's 1928 advertising offer of Catalogue and 25c Rebate Slip.

Name . . . . . .

Address . . . . . .

City . . . . . .

N. M.



Ponderosa Tomato

Big Boston Lettuce